THE MONTHLY

Review

VOLUME 31 • OCTOBER • NUMBER 10

Published Monthly
By
AMERICAN
ELECTROPLATERS
SOCIETY
545 Fifth Avenue
New York 17, N. Y.

Publisher
JACK BAIN

Editor & Secretary
E. T. CANDEE

President
MAURICE CALDWELL

First Vice-President
WALTER PINNER

Second Vice-President
FRANK SAVAGE

Third Vice-President
RAYMOND O'CONNOR

•

ASSOCIATE
EDITORS

DR. CHARLES FAUST
DR. WILLIAM BLUM
DR. RICHARD SALTONSTALL
MR. JAMES APROBERTS
MR. CLARENCE HELME

CONTENTS

CALDWELL—Research Work ..... 883 & 937
MULLIN—Silver, Lead & Indium 898
GLASSTONE—Part XII 909
NEAL—FAIRHALL—SODERBERG—
Health Notes 919

•

DEPARTMENTS

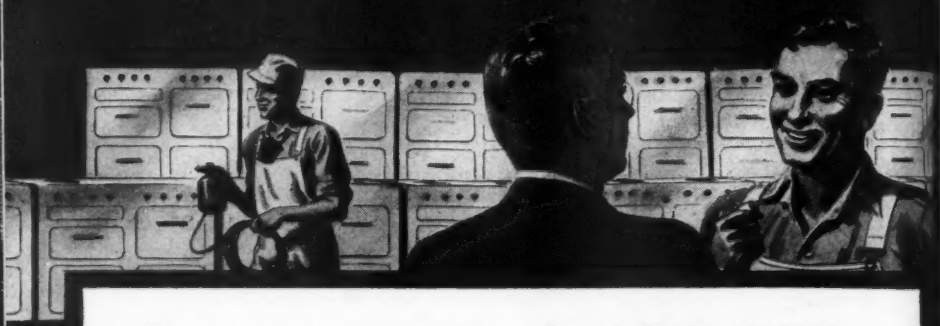
Industry News 926
New Equipment 930
Speakers 938
Branch News 944
Patents 959
Branch Directory 961
Abstract Section 962
Book Department 964
Membership 966
Advertisers Index 971

Subscription: $3.00 a year

Entered as second class matter January 21, 1943, at the post office at New York, N. Y., under the Act of August 24, 1912.

"It's the Toughest Darn Finish I've Ever Seen!"

THE SPRAY FOREMAN SAID!



HE'S the man who put it on. He knows what it is and what it will do. But that's only one side of the story of Duranite.

The men who sell the product are equally enthusiastic. They've proved the value of Duranite finishes in the one way that counts with them—in competition! They know from experience that Duranite finished products get the results they want: *sales and more sales.*

The manufacturer knows, too. He's found that Duranite is not only a better finish, but that it is the most economical coating he's ever used.

Duranite Heat-Reactive Finishes Actually Are Tough!

In whites, clears or colors, eye-pleasing Duranites come through the most gruelling tests with the highest honors. Their heat-curing time is *low*—their resistance to corrosive and mechanical action is *high!* In short, Duranites have all the qualities you want in your metal or plastic products finish — to provide added production speed, increased durability and extra sales-life!

Why not let us show you just what Duranite can do for your products—the ones you are manufacturing now or expect to be making shortly?

ZAPON
REG. U. S. PAT. OFF.

ZAPON DIVISION
ATLAS POWDER COMPANY
Eastern Sales: Stamford, Conn. Western Sales: No. Chicago, Ill.

INDUSTRIAL PRODUCT FINISHES · *Doing Tomorrow's Job Today!*

"RESEARCH WORK"

By
M. R. CALDWELL President

THE electroplating industry is surprisingly large and covers many applications. There have been many estimates as to the dollar volume of business done yearly as a result of Electroplating and its related arts. These figures run between one hundred and two hundred million dollars.

The future of Electroplating is largely dependent upon how we face the problems. There are many unknown factors in every branch of the business. There is a great need for research of all types. There are many problems which individual companies must face and solve. On the other hand, there are many other problems which are more or less common to many, which if sponsored by the A. E. S. can be more satisfactorily solved. This research work is needed by every member of the society. Finishing is our business and means of livelihood and we must strive to improve it.

The above facts are only repetition of what the majority agree upon. For instance, our past A. E. S. research carried out at the Bureau of Standards has accomplished much, and many important conclusions have been made. These were enumerated in the September REVIEW. *Please* read these if you haven't already.

The A. E. S. research activity is now being revived and we hope to organize it on a more mutual basis. That is, each A. E. S. member should feel he is a part of the program. Carl Heussner, of the Chrysler Corporation, has accepted the chairmanship of this committee which we should all appreciate, as he has instigated many projects which have ultimately made the Electroplating industry more progressive. The members of the committee as appointed by the chairman are: F. C. Mesle, F. K. Savage, R. J. Ritzenthaler, R. R. Sizeleve, M. R. Caldwell, E. T. Candee, E. W. Jones, E. Sohn, C. H. Sample, and Drs. W. Blum, A. K. Graham, W. A. Wesley, W. Phillips, E. A. Anderson, and R. M. Wick.

The first meeting of the new research committee was held at Hotel Statler, Detroit on August 28, 1944. There were many important questions discussed as we analyzed the future of the A. E. S. research and its relation to each member. Briefly, these were:

1. Why doesn't the average A. E. S. member take more interest in the work, as it is actually his activity?

2. How can we decide which are the most important problems to assign work upon?

3. Why should most of the cost of this research be carried by individual companies? Certainly, each member has a future at stake which he should be glad to support.

4. Why does the research work have to be confined to a few major subjects? There are many smaller problems which are nonethe-less important which could be worked on through fellowships in colleges and universities. We must spread the type of research so that all members will derive benefit to some degree. Also by circulating the information regarding "fellowships throughout colleges and universities" we will stimulate the interest among graduate students who would be more apt to take college training along Electroplating lines. The A. E. S. and its related arts will need these trained men in the future.

The above problems were discussed and a very definite outline of our immediate future activities were decided upon, of which you will hear and read of in the near future. Every member of the committee voted unanimously that each A. E. S. member and each branch should be given a chance to participate. This participation can probably be accomplished by urging each branch to form a research committee of three people. The chairman of this committee will ask the members to turn in suggestions at the next meeting. You will receive standard forms from the Secretary in the near future for suggestions. These suggestions will be sorted and edited. They will then be sent to the national chairman of the research committee. The problems which are most urgent and important will be worked on. However, the research committee believes in action this year. We do not get problems worked out by talking about them. Therefore, three short-term research problems are being started. These are:

1. What are the available methods of stripping copper, with or without the use of current, from various base metals?

2. What are the best methods of analysis for small quantities of metallic impurities commonly found in the various plating electrolytes?

3. What are the best methods of measuring adhesion of electrodeposited coatings?

The above subjects will be investigated and assignments made so as to obtain a review of existing literature and known information from confidential files. This review will be used as a basis to determine the advisability of starting future work on these projects.

Now I hope you, as a member of A. E. S. and interested in your future, can visualize how the results of this research work can help you individually. We hope, with your support, to be working on a few

long range programs which may take a few years to complete, but at the same time be working on shorter research problems through fellowships at colleges and universities who have experienced professors as advisers.

The above program *can* be carried out with the financial support of each member. The committee advises or recommends that each branch support this by the amount of one dollar a year per member. This may be done through the branch funds, which are supported by many activities. However, the research committee felt that an increase of one dollar yearly in dues would help to stimulate the interest of each member. Any such arrangements must be made by the branches.

Now, gentlemen and members of the A. E. S., the above program has started. The research committee needs your support, first for suggestions as to what work should be done, and secondly how you as a member decide to financially assist.

A member of the research committee will attend a monthly meeting of each branch in the near future. He will explain more thoroughly how important the work is to each of us and how we can participate. In the meantime, appoint a research committee of three so that you and your branch *will* be in shape for action.

Papers

● FOR 1945 CONVENTION AT PITTSBURGH

IT is not too early to begin thinking about papers for presentation at the 1945 Convention which is to be held next June in Pittsburgh. It is planned to group papers under several different headings according to the subject matter and to have papers under the same heading presented and discussed at the same session. In this way those interested particularly in certain subjects can arrange to attend the sessions involved, if it is not possible to attend all of them.

Some of the Subjects being given consideration are as follows:

Theoretical Papers
Electrolytic Coating of Strip Steel
Problems Involved in Reconversion
Organic Coatings
Miscellaneous Papers

Papers should be submitted in triplicate to the undersigned as early as possible in order that they may be reviewed by the Pittsburgh Educational Committee, and abstracted for the Convention Program.

Several factors, such as the central location of Pittsburgh and the probability that the War in Europe will be over, should make this an outstanding convention. Prospective authors are urged to take the opportunity which will be provided here for presenting and discussing their work before this Society.

RICHARD A. DIMON, *Chairman,*
Educational Committee,
33rd Annual Convention.
210 Semple Street,
Pittsburgh 13, Penna.

BUY WAR BONDS

Use This New Plating Process

UNICHROME

Alkaline Copper

FOR MAXIMUM PRODUCTION AT LOWEST COST

. . . You Need It For Today's War Output

. . . You'll Need It For Tomorrow's Competition

Step up war output today with the Unichrome Alkaline Copper process . . . and you'll be ready for postwar needs, too. Because of increased speed and efficiency, of smooth deposits, low temperature baths, safe operation—this process will serve you the minute civilian operations are resumed.

For copper plating now or in peacetime years, look into these features that make Unichrome Alkaline Copper the process for plants that want the best.

SMOOTH DEPOSITS

Unichrome copper deposits quickly and easily to required thicknesses . . . is exceptionally smooth and lustrous . . . needs no buffing to provide an excellent base for bright nickel. In cases where the base metal was not smooth enough, buffing is done with less time and pressure . . . needs less buffing materials.

MORE PRODUCTION

With less than 20 minutes needed to produce a .001" deposit of copper plate, output per unit of equipment is greatly increased. Deposit is free from scum, and requires no activation prior to subsequent plating. An ordinary cleaning cycle is used.

USES EXISTING EQUIPMENT

Ordinary still tanks, automatic and semi-automatic conveyors and barrels may be easily converted for use with this process. The solution gives off no harmful or objectionable fumes. It contains no cyanide, is non-toxic, and does not attack clothing or equipment. Brighteners, wetting agents or special addition agents are not needed.

IMPRESSIVE SAVINGS

Moderate temperature of the bath—100° to 140°F. — means savings in heating requirements, reduction in heat losses. Bath is stable, has a wide operating range. Throwing power is excellent—anode and cathode efficiency are 100%. Very little replenishing cost because solution is free-rinsing and does not deteriorate or build up with carbonate. Bath is easy on rack coatings and stop-off materials.

SEND FOR DETAILS

Unichrome Alkaline Copper has been tested and proved in thousands of hours of operation under widely varying conditions. Write today for details and a copy of our descriptive 6-page leaflet. To assist us in answering kindly outline your requirements briefly.

OTHER U. C. PRODUCTS AND PROCESSES TO SERVE YOU

UNICHROMIUM PLATING for wear-resisting, oil-retaining and other types of finishes.

UNICZINC for anodic treatment of zinc giving greatly increased corrosion-resistance and an attractive black or yellow finish.

UNICHROME ALKALINE STRIP BATH for speedy removal of copper, chromium, zinc, etc., from steel and cast iron without etching the base.

Trade Mark Reg. U. S. Pat. Off.

☆**UNICHROME RACK COATINGS** specially formulated to stand up under the most severe operating cycles.

☆**UNICHROME STOP-OFF LACQUERS AND COMPOUNDS** specially formulated to meet specific plating problems.

☆**UNICHROME CLEAR LACQUERS** specially formulated to meet specific finishing requirements.

☆**UCILON**—a corrosion-resistant coating for protecting surfaces against acids, alkalies, water, gasoline and various corrosive chemicals.

UNITED CHROMIUM

INCORPORATED

51 East 42nd Street

New York 17, N. Y.

Waterbury 90, Conn. ★ Detroit 7, Mich.

Announcing...
ENTHONE
Zinc
STRIPPER
ENTHONE presents a new fast acting non-electrolytic alkaline stripper for zinc (Patent Pending)
Commercial tests for the past year prove these qualities:
1. One-thousandth of an inch of zinc stripped in less than one minute.
2. No rusting, etching or attack on steel. No matter how many times zinc is stripped there is no attack on the base steel
3. Simple to use and economical to operate.
Only equipment required is a heated steel tank. Operates from 200° to 215° F
Strip defective zinc work or plating racks the modern Enthone way.
Order a trial quantity for a convincing demonstration.
THE ENTHONE COMPANY
Chemical Products – Electroplating Equipment
447 Elm Street, New Haven, 2, Conn.

RACK INSULATION

In the BUNATOL line there's a rack insulation to meet any and every need for all forms of electro plating or anodizing. For more than eight years BUNATOL has been recognized in trade circles as the best insulation from every angle.

In preparing for postwar production, remember that first-cost, fewer rejections and uniformly high quality will help you meet intense competition. BUNATOL insulation will help you in the fight for business. Here's why—

BUNATOL No. 160 was used in hundreds of shops for Copper, Nickel and Chrome before the war; in war production a vast number of racks for anodizing as well as Zinc, Cadmium and Silver plating have been protected with this dependable, easy-to-apply, long life insulation.

BUNATOL No. 720 is a new and better insulation for use in especially high-heat cleaners and possesses exceptional alkali and acid resistance. Fewer costs; lower costs. Stands up and delivers where no other insulation will give satisfactory service.

May we help you with your postwar rack insulation problems. Unless you are already using BUNATOL, let us arrange a test on your racks and work so you can find out first hand what it will do for you.

NELSON J. QUINN COMPANY
Toledo 7, Ohio

BUNATOL

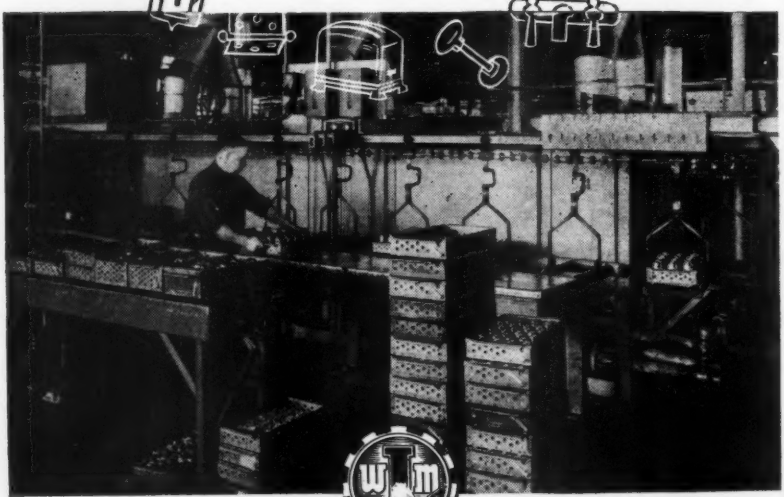
Tomorrow's best sellers will have plating plus; extra sales appeal by

INDUSTRIAL

PLATING EQUIPMENT

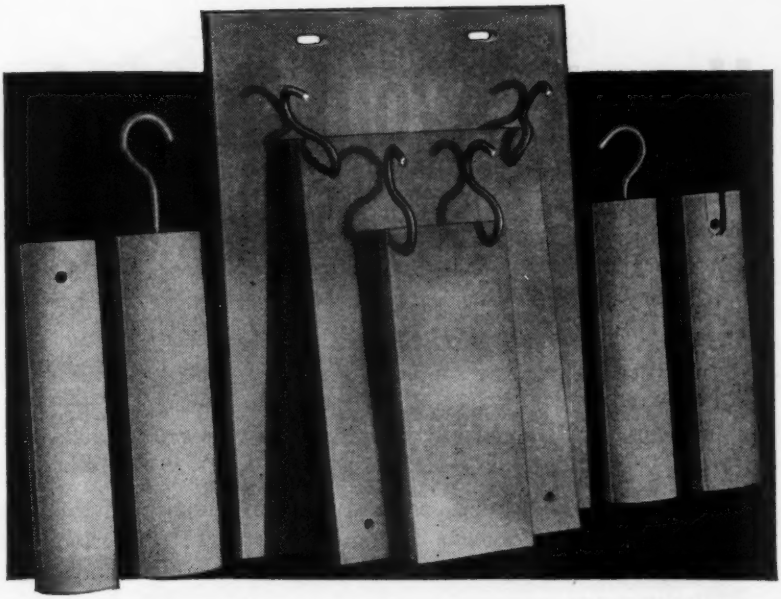
Post-war products will require enhancement, utility and durability of a particularly high calibre because competition will be intensely keen. Emphasis will be on plating because of vulnerability to both wear and eye appeal.

The fine reputation of INDUSTRIAL washing, rinsing, dipping, slushing and drying equipment for economical operation and maintenance—even under severe production schedules—is widely recognized in industry. A variation of one of the five basic designs—Conveyor, Cabinet, Monorail, Rotary Drum and Vertical—will efficiently and dependably meet specific applications.



INDUSTRIAL WASHING MACHINE CORPORATION

289-293 BURNET STREET, NEW BRUNSWICK, N. J.



Enjoy all these advantages with *Anaconda Copper Anodes*

Anaconda Copper Anodes—whether Sheet, Oval, or Electro-deposited—contain less than 0.01 percent of total metallic impurities. This unexcelled high degree of purity pays you with the following advantages:

1. Copper goes into solution faster and more uniformly.
2. The highest quality deposit is produced in the shortest possible time.
3. Slime is reduced to an absolute minimum.
4. Spotting and discoloration of the deposit are eliminated.
5. Scrap losses are exceptionally low.

American Brass produces a complete line of Copper, Brass, and Bronze Anodes . . . rolled Sheet or Oval . . . cut to your own specifications or standard sizes . . . drilled or undrilled . . . with or without hooks—also Electro-deposited Anodes.

Our entire output of Copper is now devoted to the war effort, and Anaconda Anodes are available on a high preference rating. For present or future reference, write for Publication C-5. 43159A

ANACONDA

THE AMERICAN BRASS COMPANY

General Offices: Waterbury 88, Conn. • *Subsidiary of Anaconda Copper Mining Company.* In Canada: ANACONDA AMERICAN BRASS LTD., New Toronto, Ont.

How to Avoid Corrosion
on Zinc and Cadmium Plate

Is one of your problems the protection of zinc or cadmium surfaces from corrosion—*without altering your existing full automatic machine cycles?* If so, the *Iridite* process can help you!

Iridite is applied by simple dipping for 15 to 60 seconds at shop temperature. No special personnel or unusual equipment is needed. Hot water rinse reduces drying to a few seconds. Parts can be handled freely as soon as dry.

Iridite's super-thin protective coating does not upset close tolerances. Its uniform and constant colors make inspection quick and sure, and reduce rejects. Iridite is approved under many military and industrial specifications. It is used either as a corrosion-resistant final finish, or as a firm, highly efficient paint base.

Iridite is economical, efficient, easy to apply. The process can be readily added to your plating lines. Write today for a panel of Iridited zinc or cadmium plate for testing, together with full information and operating details. Address: Rheem Research Products, Inc., 710 Chemical Building, 2523 Pennsylvania Ave., Baltimore 17, Maryland.

• • •

TEST IRIDITE FOR YOURSELF!

Write for a panel of Iridited zinc or cadmium plating, give it any corrosion test you wish. You'll see for yourself why Iridite is so widely specified; you'll see for yourself how it improves the products of your plating lines!

RHEEM RESEARCH PRODUCTS, INC.
IRIDITE

A distinctly new prime coating for metal, with new advantages and economies.

Spray it on . . . or dip it.
Dries dust free in 5 minutes.
Dries to handle in 10 minutes.
Dries to practical hardness in 20-30 minutes.
Gives hard satin finish.

No sanding required before lacquer or other top coating. METL-PRIME adheres to any metal surface . . . won't lift and it won't bleed through even a white lacquer enamel finish.

METL-PRIME is an Egyptian Product which is an assurance of high quality always. It meets war industry's exacting requirements and offers high possibilities in post-war manufacturing.

THE EGYPTIAN LACQUER MANUFACTURING COMPANY
ROCKEFELLER CENTER, NEW YORK 20, N. Y.

EGYPTIAN FINISHES

EGYPTIAN
SPECIALIZED PRODUCTION FINISHES

Presto

POLISHING WHEEL

BUSHINGS

Modern as RADAR

Another MANDERSCHEID Development of incalculable benefit to metal polishers—

Presto Bushings *make it easy* to change polishing wheels *quickly, without spindle wear and without risk to operator.*

They *keep wheels concentric—running true without chatter.* Uniform contact all around the wheel *assures even wear and does a better job, quicker, with no waste of grain.*

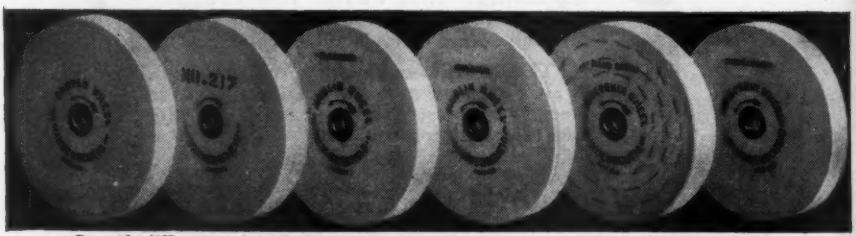
You can easily insert Presto Bushings into the wheels you have by using your own polishing lathe spindle as a screw press as illustrated.

Write for samples and see the difference. Just specify size of spindle on which wheel will be used.

Jobbers in principal cities.

A girl can change Presto-equipped Polishing Wheels EASILY and SAFELY
BUSHING
PAT. PEND.
Just press them in on your own spindle.

The notches hold the bushing in — the wheel *stays concentric regardless of how often changed.*



Specify "*Equipped with Presto Bushings*" when you order polishing wheels. Illustration shows new polishing wheels equipped with Presto Bushings.

The MANDERSCHEID *Co.*

605 West Washington St., Chicago 6, Illinois

Serving the Metal Finishing Trade over 35 Years.

ELECTROPLATERS

✓CHECK FOR INFORMATION OR WRITE FOR HELP ON PROBLEMS

OUR line of Special Finishes for Electroplaters meets all customary requirements. For detailed information on any of these finishes, merely check the list below, attach to your letterhead and mail.

If, however, you have an individual problem, write for the helpful Wartime Consultation Service of our staff of finishing engineers. They will gladly give you the benefit of a vast amount of research into materials and methods to relieve today's problems of shortages and curtailments. There is, of course, no obligation.

CLEAR LACQUER for steel . . silver . . gold . . brass . . copper . . nickel and other metals . . .	**NON-STAIN SPOT LACQUERS** especially developed for protecting coatings of copper . . brass . . silver . . .	**WATER-DIP No. 33** for iron, aluminum, cadmium - plated and other production plated parts . . eliminates fingerprints and staining during assembly.
BURN-PROOF LACQUER for ash receivers, trays, etc. . . .	**PERSPIRATION-RESISTING LACQUER** for pencils, flashlights, and other frequently handled products . . .	**BRONZE LACQUERS** that do not jell or discolor with bronze powder . . produce beautiful metallic finishes . . .
TOP-COAT LACQUER high gloss . . mat . . .	**LACQUER-ENAMELS** in all colors and for every purpose . . .	**DULAC RACK ENAMELS** for protecting plating racks . . .
DULAC STOP-OFF LACQUERS for sectional plating . . .	**CLEAR PRIMERS**	**PLATELUSTRE** a semi-transparent coating that simulates many plated finishes and gives a colored metallic effect.

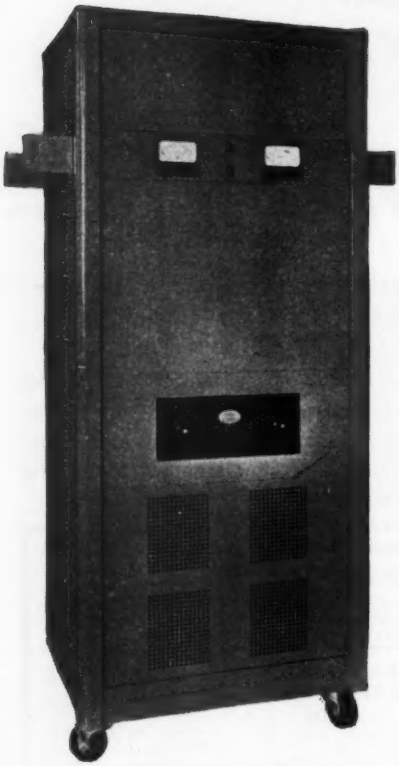
M&W **MAAS & WALDSTEIN CO., NEWARK, N. J.**

Branch Offices and Warehouses

1658 Carroll Ave., Chicago • 1228 W. Pico Blvd., Los Angeles

SELECTRO-PLATER

COMPLETE IN ONE CABINET WITH BUILT-IN METERS AND CONTROLS



42" Wide, 24" Deep
Approx. 81" Tall
Capacity up to 5000 amps
at 6 volts.

STANDARD THREE-PHASE UNITS:

6 volts—100 - 160 - 200 - 300 - 400 - 500 - 800 - 1000 - 1200 - 1500 - 2000 - 2500 - 3000 - 4000 - 5000 amperes

8 volts—100 - 200 - 300 - 400 - 500 - 600 - 800 - 1000 - 1200 - 1500 - 2000 - 2500 - 3000 - 3500 - 4000 amperes

12 volts—80 - 100 - 200 - 250 - 400 - 500 - 750 - 1000 - 1500 - 2000 - 2500 - 3000 amperes

16 volts—100 - 200 - 300 - 400 - 500 - 600 - 750 - 1000 - 1200 - 1500 - 1800 - 2000 amperes

18 volts—100 - 250 - 500 - 750 - 1000 - 1500 amperes

24 volts—100 - 200 - 300 - 500 - 750 - 1000 - 1500 amperes

32 volts—100 - 150 - 200 - 300 - 500 - 750 - 1000 amperes

48 volts—100 - 150 - 300 - 500 - 600 - 750 amperes

64 volts—100 - 150 - 250 - 375 - 500 amperes

★

Special requirements are met by engineering to individual needs.

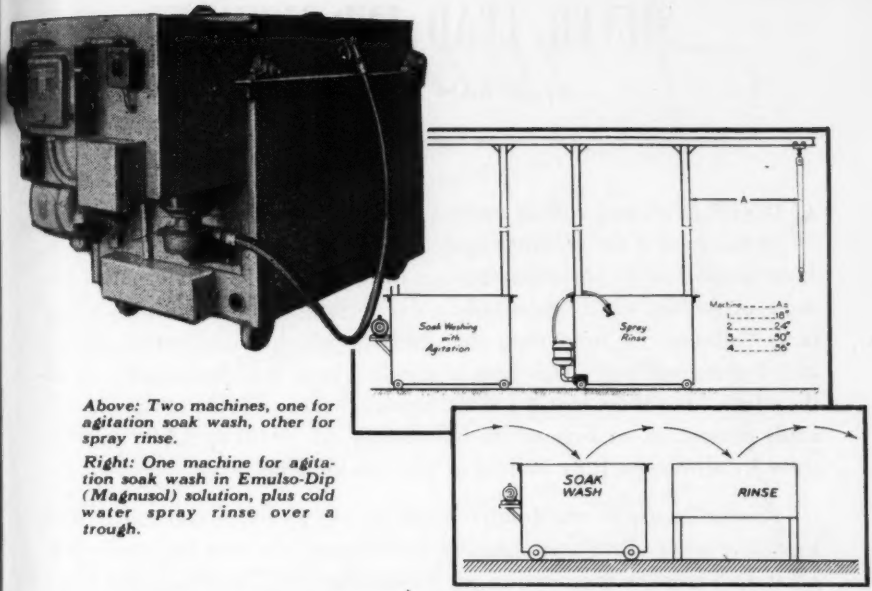
★

Write Dept. R for illustrated booklet.

W. GREEN ELECTRIC COMPANY, INC.

GREEN EXCHANGE BLDG., 130 CEDAR ST., NEW YORK 6, N. Y.

RECTIFIER EST. G 1892 **ENGINEERS**



Above: Two machines, one for agitation soak wash, other for spray rinse.

Right: One machine for agitation soak wash in Emulso-Dip (Magnusol) solution, plus cold water spray rinse over a trough.

Use Any Cleaning Set-Up Your Products Require—and Get Speedier, Better Results

You can meet any requirements in sequence of cleaning operations as well as insuring faster, improved cleaning results when you equip with the new

MAGNUS ALL-PURPOSE PORTABLE METAL CLEANING MACHINE

It can be used on any metal, on any size and shape of object, with any cleaning material. Individual units can be used for soaking and/or spraying for washing and rinsing. Used alone or in suitable combination with other units or machines, practically any combination of treatments can be provided.

This machine provides a unique "swishing" type of agitation obtainable only when the *work* is moved in and out of the cleaning solution at high speed.

Investigate this new machine. It is available in a wide range of sizes at prices from $300 to $800 per unit, depending on size and type of heating provided.

Bulletin 3600 *describes this unique machine, its applications and its time and labor-saving possibilities. It will pay you to write for a copy now.*

Magnus

MAGNUS CHEMICAL COMPANY · 41 SOUTH AVENUE · GARWOOD, N. J.

CLEANERS·METHODS·MACHINES

SILVER, LEAD AND INDIUM

By URBAN A. MULLIN

SILVER, lead and indium make a combination which, to date has not been excelled for bearings subjected to high speeds and heavy loads. Each metal has its particular service to render. Silver, internally, has those properties which resist failure due to fatigue, but externally silver lacks "oiliness" or some such characteristic which would permit its use as a bearing surface. That lack is supplied by a thin deposit of lead on the silver. But there is still a fault, because lead is soluble in the organic acids present in, or formed in, lubricating oil. This difficulty is overcome by alloying a little indium or tin with the lead.

Silver bearings are usually made by electro-deposition on a steel base, and since silver has a tendency to deposit on iron by immersion, great care must be exercised to get good adherence. Furthermore, since the deposit may be up to .050" thick, extra precautions must be taken to prevent porosity and included impurities.

Preparation for silver plating begins in the machine shop. Most manufacturers machine or grind the surfaces to be plated, to a 50 micro inch finish (1 micro inch = .000001"). Good tooling is required to prevent imbedding small particles in the surface of the part; such particles might or might not be removed in subsequent treatment.

Very few silver jobs are plated all over, and that introduces insulation. Both lacquer and mechanical masks are used. In the case of lacquer, the material must withstand the action of hot cleaners; it must trim sharp and clean, and not lift at the edges; it must have excellent adherence so it will not curl up on a flat surface, or pull away on an inside diameter; it must be chemically inert so that it will not break through after several hours in the plating bath. Mechanical masks are preferred when the shape of the part permits,—as on the O. D. of a cylinder.

When insulating a part, the insulation is made to stop short of the area called for on the print. For example if the print called for silver plate for a 2" distance in the center of a bar 4" long we would insulate, not 1" in from either end, but 7/8" in from either end leaving 2¼" length of silver in the center. We anticipate that there will be an area of poor adherence where the silver and the insulation meet, and we provide the increased dimension so that it can be removed. This operation also

5 Reasons – Why

Here are five good reasons for ordering TROMEX, the stabilized trichlorethylene degreasing solvent:

1. *All-Purpose:* TROMEX gives excellent results in any type of degreaser *on all metals*—aluminum and magnesium as well as heavyweight metals.

2. *Low Boiling-Point:* requires a minimum of heat because it boils at 186°F.

3. *Chemically Stabilized* by additives which inhibit oxidative breakdown and metal-induced decomposition.

4. *Low Cost:* TROMEX costs no more to buy and is frequently more economical to use than commercial trichlorethylene solvents. It does "premium" cleaning but sells at regular trichlorethylene prices.

5. *Prompt Delivery.* We solicit the opportunity to quote on your degreasing-solvent requirements. Your inquiry will have our prompt attention.

Westvaco CHEMICALS

TM Reg. U.S. Pat. Off.

WESTVACO CHLORINE PRODUCTS CORPORATION

405 LEXINGTON AVENUE • NEW YORK 17, N. Y.

CHICAGO, ILL. • GREENVILLE, S. C. • NEWARK, CALIF.

gives us a clean silver-steel interface for black light inspection, which will be discussed later. This same provision should be made when mechanical masks are used.

The greatest single problem in silver plating is adherence. The surface must be absolutely free from all of the usual dirt (rust, oil, finger marks, lacquer, etc.) and it must also be free from any particles burnished into or imbedded in the steel. It is assumed that the part has been cleaned by the usual methods before insulation. If lacquer was used, be sure there are no spots left in tool or grinding marks on the surface to be plated. It is often advisable to use a fixture when applying lacquer, so that spots will not get on that surface, especially if the finish is not good.

The insulated part is made anode in an electric cleaner, followed by hot water rinse and cold water rinse. Next comes the acid treatment, which may be any one of these:

1. Muriatic acid, 50 to 75% for 15 to 20 seconds.
2. Sulfuric acid 10 to 20%, for 15 to 30 seconds.
3. Sulfuric acid, 10%, anodic.
4. Phosphoric acid 75%, anodic.

Probably the muriatic dip is the safest for general use. The two anodic dips may or may not raise a smut, according to the composition of the steel. Our standard practice calls for the muriatic, without current, followed by cold water and cyanide before copper strike, or cold water only before nickel strike.

Copper is used for the first strike coat on parts which can not be annealed at 950° F. The bath is:

Sodium Cyanide	4.5 oz. per gal.
Copper Cyanide	3.5 " " "
Sodium Carbonate	2.0 " " "
Sodium Bisulfite	.5 " " "
Temperature	110° F.

15 to 30 amps. per sq. ft. for 5 minutes.

Copper strike is followed by cold water rinse, dip in muriatic, cold water rinse, cyanide dip and then silver strike.

Nickel is used for the first strike coat on parts which can be annealed at 950° F. The bath is:

Nickel Sulfate	15 oz. per gal.
Boric Acid	4 oz.
Ammonium Chloride	3 oz.

pH 5.3-5.8

Current density 20 amps. per sq. ft. for 5 minutes. Nickel strike is followed by cold water rinse, cyanide dip, and then silver strike.

Silver Strike bath is:

Silver Cyanide	0.4 oz. per gal.
Potassium Cyanide	21. oz.
Potassium Carbonate	2. oz.

Current density 10 to 15 amps. per sq. ft. for 1 to 3 minutes and current must be connected before the work is put in the tank.

There are many high speed silver plating baths, all with high metal content; some with brighteners; some operated at elevated temperatures. The choice depnds on the amount of circulation obtainable and whether quantities to be plated justify proper tooling. In the laboratory, under ideal conditions, we have plated .065" thickness in one hour with the following bath:

Silver Cyanide	14.5 av. oz. per gal.
Silver Metal	11.7 " " " "
Potassium Cyanide	22.0 " " " "
Potassium Cyanide (free)	14.5 " " " "
Hypo	.13" " " "
Current density	400 amps. per sq. ft.
Peripheral speed	212 ft. per minute
Temperature	135° F.

The piece plated in this laboratory set-up is a steel tube 1⅝" diam. x 2½" long. It is mounted on a vertical spindle, and rotated at 500 R.P.M.

Many high production jobs, where quantities justify the equipment, plate at 50 to 100 amps. per square foot. With miscellaneous shapes and small quantities, the limit might be 30 amps. per sq. ft., with cathode bar oscillation or flow-tube circulation.

One of the most popular baths contains 6.7 av. oz. per gal. of silver cyanide and the same or somewhat larger amount of free potassium cyanide. To this may be added 2 oz. per gal. potassium hydroxide, with or without hypo and ammonia. Hypo is usually ¼ oz. per gal., and ammonia ⅛ of a fluid oz. per gal. Subsequent additions of brightener are best determined empirically. For this purpose, mount on a rotating spindle a piece of tubing 1¾" diam. by 2⅝" long. This gives an area

of 1/10 of a sq. ft. Place 1 gallon of the plating solution in a round glass jar. Make up one quart of hypo, mixture; hypo 1 oz. per quart ammonia ½ fl. oz. per quart. Rotate the test piece at a rate which duplicates the peripheral speed of production parts. Or if this can not be done, adjust temperature and current density to production conditions. Add measured amounts of hypo mixture until the desired brightness is obtained. Calculate the addition required for the production tank. Keep a record of hypo additions per 24 hours, and it will be found that the additions vary with elapsed time rather than with the amount of work put through the tank. Having determined this figure, make the additions at regular time intervals,—say every 4 hours or less, with only occasional checks on the test apparatus. If hypo is used, the current should not be interrupted even though the work is not taken out of the tank, or a laminated plate may result.

Unusual precautions are taken to keep the bath clean. The solution is filtered continuously; anodes are bagged; anode and cathode rails are removed from the tank for cleaning (instead of letting the dirt fall into the bath); solution is filtered as required, with carbon, but siliceous filter aides are avoided; additions are dissolved in a separate tank and filtered; and in some installations the air in the room is filtered. There must be no air entrained by the pumps or other equipment used for agitation or filtration.

After silver plating, parts which were struck with nickel are annealed at 950°F. Heat treatment serves two purposes in addition to annealing; it brings out incipient blisters, and it improves the bond between nickel and the base. We are not sure why the bond is improved, but one explanation is that the nickel strike is too brittle and heat treatment softens it by removing hydrogen.

Parts are then machined to get rid of the area of poor adherence at the junction of plate and insulation. This operation must be done carefully to give a good clean cut, free from flowed or burnished metal, and the cut must be from silver to steel. Otherwise, we may lay the steel over on the silver forming a pocket which will appear later as a black light failure. Final silver surfaces should be finished with diamond tools.

The black light operation consists of degreasing the part, which at the same time heats it to 180° F. or more, and transferring it immediately to a fluorescent oil mixture which is held at less than 100° F. As the part cools, the fluorescent mixture will be sucked into any pits, or crevices between the silver and the steel. Drain off the excess oil, flush gently with water, wipe with a clean cloth, and examine under a fluorescent lamp to be sure the surface is free from oil. Then place on a hot

plate and heat to 225°-250° F. If there are any pits or crevices, heating will cause the oil to ooze out and fluorescent spots will appear.

Lead is plated to size, and since tolerances are very close, plating conditions must be carefully controlled. The fluo-borate solution is used at 16 oz. per gal. of lead, and 23 to 25° Baume. Glue (1/40 oz. per gal.) or other suitable addition agent is added as required. Solution is filtered daily, and anodes are bagged. Work is degreased, soaked in soap solution, rinsed in hot water, then cold water, and scrubbed with pumice on a soft brush. Rinse thoroughly and scrub the pumice off with a clean brush. In place of the pumice scrub, work may be cleaned cathodically for 15 seconds in standard alkali cleaner. Lead plate at 15 amps. per sq. ft., room temperature.

On each shift, a pilot part is cleaned, weighed, lead plated under standard conditions, and weighed again. The plating rate is calculated, and if it comes between .060 and .067 grams per ampere minute, the operator proceeds with production. If it does not come within these limits, he locates the source of trouble himself, or calls for help. At 15 amps. per square foot, the bath should deposit .001" thickness of plate in 28 minutes.

Immediately after lead plating, parts are rinsed in cold water, dipped in cyanide, and placed in the indium bath. The cyanide bath is used. The solution is bought as indium cyanide concentrate, 8 tr. oz. of metal per gallon. For use, it is diluted with an equal volume of distilled water containing 10 oz. sodium cyanide per gallon. Since inert anodes are used, the bath is replenished as required with the concentrate.

Indium is plated at 15 amps. per sq. ft. and the amount deposited is 4% of the weight of lead deposited. At 15 amps. per sq. ft. for both lead and indium, 28 minutes of lead plate will require 10 minutes of indium plate. The operation of the indium bath is checked in the same way as the lead bath. The pilot part used for lead check is indium plated under standard conditions and weight. The amount deposited must fall between .0067 and .0075 grams per ampere minute.

After rinsing and drying, parts are heated in an oil bath for two hours at 350° F. to diffuse the indium into the lead. If, for metallurgical reasons, the part can not be heated to 350° F., it is heated to 250° F. for 5 hours; and even lower temperatures can be used if the time is increased.

The subject matter of this paper has been gathered from experience, and from many outside sources, so proper acknowledgments are impossible. Nor was it intended to give too complete details; but further information will be gladly given to the best of our ability.

ELECTRO ★ PLATERS!

For Rapid, Safe, Efficient, Economical Metal Cleaning Use COWLES AP and EL Cleaners and LIXOL

SPEED, without sacrificing quality in preparing and cleaning steel parts for plating and other finishing, can be attained by the use of Cowles AP and EL Cleaners. They may be used with or without electrical current, direct or reverse. Cowles AP and EL Cleaners contain the correct quantity of wetting agent that forms a blanket over the solution tank to prevent fuming and also to allow maximum use of current available. Cowles LIXOL-emulsion solvent type Cleaner can be used to advantage as a pre-soak if necessary. Let the Cowles Technical Man make definite recommendations on your problems.

BUY MORE WAR BONDS

THE COWLES DETERGENT CO.

7016 Euclid Ave. Cleveland 3, Ohio

Metal Cleaner Dept.

A *New* KEY

TO CHROMIUM BRILLIANCY FOR DULL ZINC SURFACES

"Essentials" in industry today are efficiency of operation in less time . . . at less cost. **Luster-on,** the revolutionary bright dip for dull zinc surfaces, meets these requirements **plus** a brilliant mirror-like finish which is passive. Zinc treated with Luster-on yields a new finish . . . with **brighter zinc than can be obtained by any known plating** bath . . . **or any known bright dip.**

KEMO says: "Rush us a sample piece of metal to be processed . . . we'll rush it back to you . . . free! Order **Luster-on acid** bath in convenient 13-gallon carboys . . . **Luster-on salts** in 100- or 400-pound drums! Meets specification A. N. P. No. 32, Amendment No. 2 for no white corrosion products."

THE *Chemical* CORPORATION

93 Broad St., Springfield 5, Mass.

First
BECAUSE THEY'RE
Finest

AMERICAN
MADE
Felt
POLISHING
WHEELS

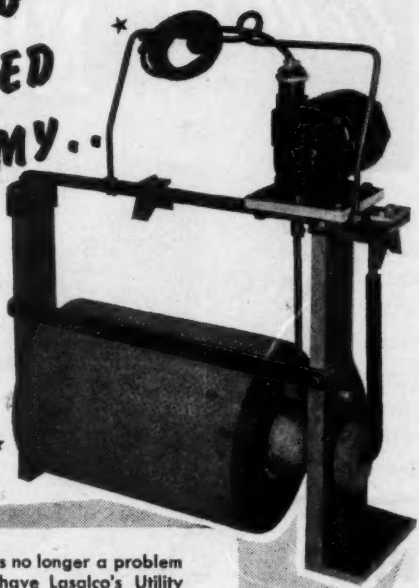
"American Made" Felt Polishing Wheels are made of high grade pure wool. No loading or weighting of any character is used. The material is uniform in texture throughout the wheel. Hardness is acquired by shrinkage of wool only — the greater the shrinkage the harder the wheel. Made in any diameter, also in face widths from ½" to 6". For wider face widths, submit specifications. "American" felt wheels are made in nine degrees of hardness.

Write, wire or phone for further information

AMERICAN BUFF COMPANY
Factory & General Offices
711 WEST LAKE STREET, CHICAGO 6, ILLINOIS
Sales Offices in Principal Cities

FOR PLATING ROOM SPEED AND ECONOMY..

CHECK LASALCO'S UTILITY BARREL PLATER!



FASTER and more uniform plating is no longer a problem in hundreds of plants who now have Lasalco's Utility Plater. Versatile, to handle any process required for small lots of varying grades and types of material, the Utility Barrel Plater is matched by no other equipment available in its price class.

• *INVESTIGATE THESE PROVEN ADVANTAGES*

- Can be hung in any plating tank on the cathode rod and operated from the nearest light socket
- Easy to load and unload because of its extreme portability
- Nothing plates but the load—no "tree-up" on the cylinder
- Less dragout loss because barrel revolves as it is lifted from solution
- Hand shifting of cylinder is entirely eliminated
- Rugged, durable, long-life operation is guaranteed by its heavy canvas base Bakelite construction
- Specially designed, sturdy, geared-type motor
- Cylinder sizes: No. 1—Dia. 6"x12" long; No. 2—Dia. 9"x12" long

Write Lasalco today and learn more of the advantages offered by the Utility Barrel Plater. Also ask about Lasalco's complete service on plating and finishing room equipment and material.

LASALCO, INC.

2818-30 LA SALLE STREET ST. LOUIS 4, MISSOURI

*Ventilated NON-FRAYS

THE MARK OF QUALITY

Also RIPPLE SEWED CHAMPION PIECED BUFFS

Polishing Wheels and Burring Bobs for every Operation

We are engaged essentially in War Work

*Patent Nos. 2,027,863; 2,094,650; 1,573,961; Re. 19,894; 2,140,208

F.L.&J.C.

TRADE MARK

CODMAN COMPANY

Buffing and Polishing Wheels

ROCKLAND • MASSACHUSETTS

DETROIT OFFICE 7637 OAKLAND AVENUE

PHILADELPHIA OFFICE, 1123 REAL ESTATE TRUST BLDG.

PHILADELPHIA 7, PENNSYLVANIA

The Fundamentals of Chemistry for Electroplaters

Part XII. The Chemistry of Some Common Acids

By SAMUEL GLASSTONE, D.Sc., Ph.D.

ACIDS IN ELECTROPLATING

IN the preceding article (Part XI, *Monthly Review*, September 1944) a general description was given of the characteristics of acids. It is now proposed to describe in somewhat more detail the particular properties of a few individual acids of special interest to electroplaters. The three "minerals acids," namely sulfuric acid ("oil of vitriol"), hydrochloric acid ("muriatic acid"), and nitric acid are frequently used for cleaning, pickling, and stripping purposes, as well as for actually making up certain electroplating solutions. In addition, boric acid, hydrofluoric acid and chromic acid are employed in the plating of nickel, lead and chromium, respectively.

SULFURIC ACID: MANUFACTURE

Sulfuric acid is probably the most important of all industrial chemical products. In the United States it is usually made from the element sulfur which is obtained from the vast underground deposits in Texas and Louisiana. The sulfur is first burnt in a current of air, and this causes the sulfur (S) to combine with the oxygen (O_2) of the air to form the compound sulfur dioxide (SO_2); in terms of a chemical equation the process may be represented simply by

$$S + O_2 = SO_2.$$

The sulfur dioxide, which is a gas, is then mixed with more air, if necessary, to supply additional oxygen, and the resulting gaseous mixture is passed over a solid substance, known as a "catalyst," heated to a temperature of about 500° C. The purpose of the catalyst is to speed up the reaction between the sulfur dioxide and the oxygen gases. Until recent years a form of the precious metal platinum was used as the catalyst, but this has been largely replaced by one based on vanadium pentoxide. This is not only a much cheaper material, it has also certain other advantages. The interaction between sulfur dioxide and oxygen on the surface of the catalyst results in the formation of sulfur trioxide (SO_3), according to the equation

$$2\,SO_2 + O_2 = 2\,SO_3.$$

At the high prevailing temperature the sulfur trioxide is in the gaseous state, and it could be absorbed directly in water (H_2O) to form sulfuric acid (H_2SO_4), thus

$$SO_3 + H_2O = H_2SO_4.$$

However, owing to the violence of the reaction much of the resulting acid is lost in the form of a mist of fine droplets, and so pure water is not used for the absorption of sulfur trioxide. Instead the gas is passed into a solution consisting of sulfuric acid and a little water. The reaction shown above is moderated in this manner, and satisfactory absorption occurs. Water is added to the solution from time to time so as to obtain a constant concentration of sulfuric acid, about 98 per cent.

SULFURIC ACID: PROPERTIES

In the pure, or fairly pure, state sulfuric acid is a heavy, oily liquid. Like the other mineral acids, it is highly corrosive and must be handled with care. If mixed with water the concentrated acid gives off much heat, and when preparing the diluted acid it is essential that the acid be added to the water (and not the water to the acid), otherwise a serious accident may result due to the spattering of the hot acid. The dilute acid readily attacks many common metals, such as magnesium, zinc, iron and cadmium, with the evolution of hydrogen gas and the formation of the sulfate of the metal (see Part XI, September 1944). The hot concentrated, almost pure, acid will readily attack copper and silver, and even gold and platinum to some extent. In these cases there is no formation of hydrogen, but sulfur dioxide is obtained. The sulfuric acid is here acting as an oxidizing agent, and it is reduced by the metal (see Part IX, July 1944) to sulfur dioxide, containing a lower valence state of the element sulfur. With the basic oxides and carbonates of metals, sulfuric acid forms the sulfates of the corresponding metals.

Sulfuric acid has many uses, several of which will be familiar to electroplaters. It is used for stripping, pickling and dipping solutions, and it is also a constituent of several acid plating baths. The acid in the familiar lead storage battery is, of course, sulfuric acid in about 20 per cent concentration.

HYDROCHLORIC ACID

Hydrochloric acid was at one time called "spirits of salt" because common salt was the raw material used in its preparation. At the present time much of the hydrochloric acid is made by the direct combination of hydrogen (H_2) and chlorine (Cl_2) gases. These two substances are usually obtained by passing an electric current through, that is, by electrolysis of, a solution of sodium or potassium chloride in water. (It

may be mentioned, incidentally, that the purpose of this process is the manufacture of sodium or potassium hydroxide, which will be described in a later article). By means of a suitable device the chlorine gas is made to burn in an atmosphere of hydrogen to form hydrogen chloride (HCl) gas, thus

$$H_2 + Cl_2 = 2\,HCl.$$

The resulting gas is then absorbed by water to form what is known as hydrochloric acid; this is also represented by the formula HCl, although its properties differ from that of the gas (HCl) which is called hydrogen chloride. The concentrated acid obtained commercially, saturated with hydrogen chloride gas, contains about 37 per cent of hydrochloric acid by weight.

Hydrogen chloride is also obtained as a by-product in the manufacture of "salt cake," sodium sulfate (Na_2SO_4), required by the glass industry. In this process sodium chloride (common salt) is heated strongly with concentrated sulfuric acid, when the following reaction occurs:

$$2\,NaCl + H_2SO_4 = Na_2SO_4 + 2\,HCl.$$

The hydrogen chloride gas is absorbed in water as described above.

Hydrochloric acid solution is a corrosive liquid which fumes in moist air. Like most other acids it interacts with basic oxides and the carbonates of metals to form the corresponding salts, the chlorides. Hydrochloric acid dissolves many metals with the evolution of hydrogen. It has the unusual property of attacking stainless steel and chromium plate. The uses of hydrochloric acid in plating are similar to those of sulfuric acid, as given above.

NITRIC ACID

Nitric acid (HNO_3) is not extensively employed in electroplating, although it is a constituent of some pickling baths. It readily dissolves certain metals, particularly copper and silver, which are resistant to attack by most other acids. Nitric acid is made by heating sodium nitrate ("Chile saltpeter") with concentrated sulfuric acid and condensing the vapors which are liberated. At the present time large quantities of nitric acid are made from the nitrogen gas present in the air. In this way the United States, and other countries, have become independent of imported materials for the manufacture of nitric acid extensively used in the production of explosives. Nitric acid is an extremely corrosive substance and is also a powerful oxidizing agent. A mixture of one volume of nitric acid and three of hydrochloric acid is known as "aqua regia" (royal water); it is such a powerful oxidizing and corroding material that it will dissolve nearly all metals, including gold, and many other refractory materials.

BORIC AND HYDROFLUORIC ACID

Boric acid (H_3BO_3), which is used as a "buffer" for regulating the acidity of certain nickel plating baths, differs from the minerals acids just described in at least two respects. In the first place, the mineral acids are strong acids, while boric acid is a weak acid. In the second place, boric acid is a solid, and it is only slightly soluble in water, about five parts by weight per hundred of water at 20° C. Large quantities of boric acid have been obtained in a pure state from the volcanic steam jets issuing from the ground in Tuscany, Italy. It is also made by the addition of mineral acid to a solution of a borate, that is, a salt of boric acid; of these, the naturally occurring mineral "borax" is perhaps one of the best known.

In the past few years electroplaters have become interested in hydrofluoric acid (HF), because together with boric acid it yields the fluoboric acid (HBF_4) which has been widely adopted for use in lead plating baths. Hydrofluoric acid is made by heating a fluoride, usually calcium fluoride (CaF_2) in the form of the mineral "fluorspar" or "fluorite," with concentrated sulfuric acid. Hydrogen fluoride gas (HF) is set free, as shown by the equation

$$CaF_2 + H_2SO_4 = CaSO_4 + 2\,HF,$$

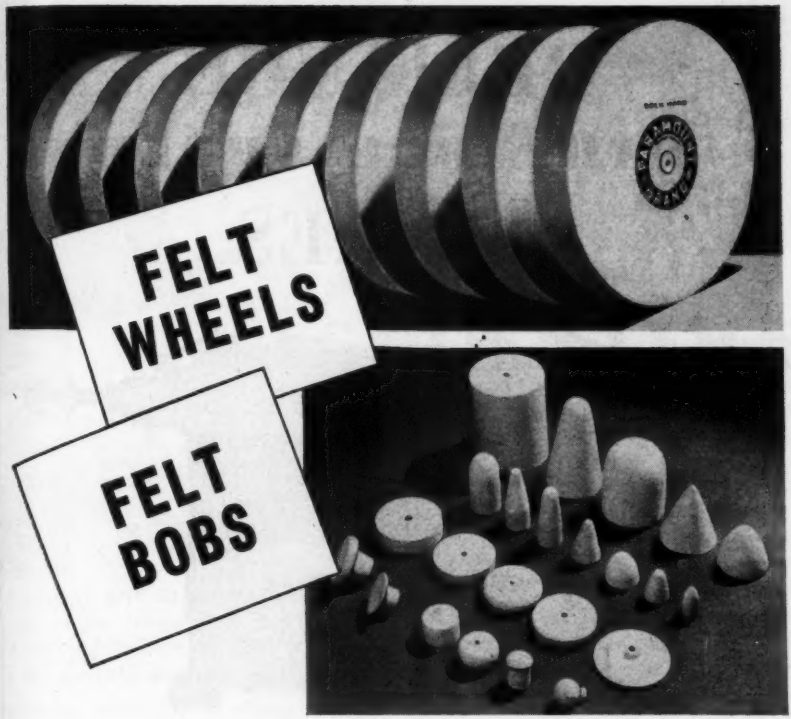
and is absorbed in water to form hydrofluoric acid. Although it corrodes metals less vigorously than some other acids, hydrofluoric acid has the unusual property of attacking glass. It is therefore stored in bottles made of special wax, rubber or lead. In addition to its use in the preparation of fluoboric acid for lead plating, hydrofluoric acid is a constituent of certain pickling solutions.

CHROMIC ACID

The red colored solid known as "chromic acid," which is the chief constituent of chromium plating baths, is not really an acid in its pure form. It has the formula CrO_3 and so contains no replaceable hydrogen; it thus lacks the characteristic property of an acid (see Part XI). However, when dissolved in water the solid reacts with the water to form an acid solution, containing among other substances the true chromic acid, H_2CrO_4. Because it is not strictly an acid in the pure state, chemists prefer to call CrO_3 by the name chromium trioxide, although the designation "chromic acid" is invariably, if incorrectly, used in commerce. Chromium trioxide is made by the addition of concentrated sulfuric acid to a solution of the salt potassium chromate (K_2CrO_4), thus:

$$K_2CrO_4 + H_2SO_4 = K_2SO_4 + H_2O + CrO_3.$$

The "chromic acid" separates out in the form of the well known red crystals. The chief source of potassium chromate is the mineral "chromite" or "chrome iron ore," which is a chromate of the metal iron. Chromium trioxide has many applications in chemical industry, apart from its use in electroplating, for it is a very powerful oxidizing agent.



DID you know that to be of the highest quality, felt wheels and bobs still require what to some might seem to be old fashioned methods? The skill of the human hand . . . the experience of old-time felting craftsmen are revealed in the fine quality of PARAMOUNT BRAND Wheels and Bobs.

For many finishing or burring operations, felt wheels and bobs do the best work. But even felt wheels and bobs vary. PARAMOUNT BRAND yields to none in its quality. There are many degrees of hardness available for the wheels and countless shapes for the bobs.

BACON FELT COMPANY

"America's Oldest Felt Manufacturers"

Winchester, Mass. **Established 1824**

"Felt Does It Better"

RELIANCE
VARIABLE SPEED
LATHES

Reliance Variable Speed Lathes Cut Costs
There is a RELIANCE LATHE for every need.

Let us quote on your requirements.

Chas. F. L'Hommedieu & Sons Co.

MANUFACTURERS

Plating and Polishing Machinery

Complete Plating Plants Installed

Gen. Office and Factory:

4521 Ogden Ave. **Chicago, Ill.**

Representatives
O. M. Shoe, Philadelphia, Pa.
Wm. R. Shields, Detroit, Mich.
C. B. Little, Newark, N. J.

Branches
LOS ANGELES and
CLEVELAND

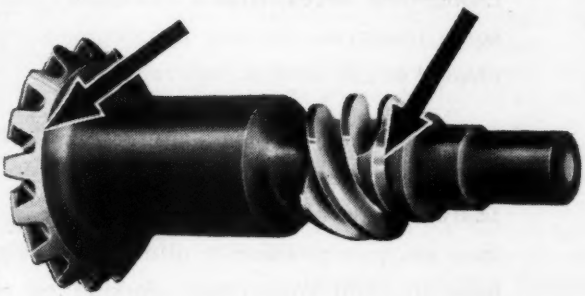
5 MICCRO COATINGS *for* MASKING PARTS *for* SELECTIVE PLATING

To meet *every* need for masking parts prior to selective plating, Michigan Chrome and Chemical Company produces Miccro-Supreme Stop-Off Lacquers in two colors (red and black) and Miccrome in three colors (red, blue and green). Among the principal characteristics of these coating materials are unexcelled protective qualities, excellent adhesion, and good dielectric strength. Each can be quickly and easily applied or removed.

If you do selective plating, one of these materials is exactly suited to your requirements. Full information is contained in our "Manual of Protective Coatings"—available to you without charge or obligation.

Above: Part being masked for hard chromium plating. Miccrome was especially developed for this purpose. Miccro-Supreme Stop-Off Lacquers HR-302 and HB-401 are also widely used.

At right: This part was masked with Stop-Off Lacquer for copper plating prior to carburizing. Gear teeth only were stopped off. Note clean, sharp lines of demarcation.



MICHIGAN CHROME & CHEMICAL CO.
6344 EAST JEFFERSON • DETROIT 7, MICHIGAN

Many Detrex Degreasers and Washers recently built have been designed with both War Production and peacetime applications in mind. In such cases, the changeover necessitates a minimum of rebuilding. In some instances, as with the degreaser pictured, no change of any kind is required.

Because Detrex engineers are thoroughly familiar with the capabilities and limitations, as well as war and postwar uses of present metal cleaning equipment, they are in a position to offer many helpful suggestions to plant committees working on reconversion programs. These services are available to you at any time . . . no obligation, of course.

KEEP BUYING U.S. WAR BONDS

DETREX CORPORATION

13010 HILLVIEW AVE., DETROIT 27, MICHIGAN

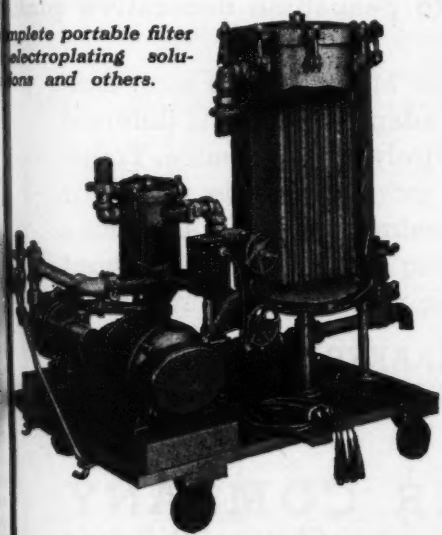
SALT FOG CORROSION TEST EQUIPMENT

This modern instrument is designed to meet all requirements of latest "SALT FOG TESTING PROCEDURE SPECIFICATIONS" to determine corrosion resistance of plated, coated, lacquered, or painted parts.

Serious rejection losses on industrial finishes which must meet Army or Navy Specifications are avoided by systematic tests with Industrial Salt Fog Test Equipment.

MADE IN FIVE STANDARD SIZES

mplete portable filter electroplating solu-ions and others.



FILTERS

Industrial filters offer you a modern and dependable clarification and purifying system to keep your plant producing at top speed. Avoid costly losses by using the correct size and type of filter for the job to be done. Industrial filters are made in a wide range of sizes and capacities, both portable and stationary. They are designed and built to use all the modern filter aids in a highly efficient manner. Our method means fine filtration at low cost.

Write for New literature and complete information

INDUSTRIAL FILTER & PUMP MFG. CO.
1621 WEST CARROLL AVENUE • CHICAGO 12, ILLINOIS

WITH **MEAKER EQUIPMENT**

You are ready for Quick Conversion to Peacetime Decorative Plating . . . . .

Choose the plating equipment you install for war work w an eye on quick conversion to peacetime decorative plati

MEAKER Full Automatic Machines are most flexible, and can be readily adapted to handle different size racks through an entirely new sequence. Transfer mechanism may be moved or made wider, or "lift" increased at a nominal expense. Unit may be lengthened by adding new sections, without junking any considerable part of the old machine.

MEAKER Equipment is simple, compact, accessible, and oversize to stand continuous operation.

THE MEAKER COMPANY
1635 South 55th Avenue • Chicago 50, Illinois

MEAKER EQUIPMENT

Straight-a-way Full Automatic Plating Conveyors
Return Type Full Automatic Plating Conveyor
Semi-automatic Plating Machine
Specially-designed Plating and Processing Machines
Strip Steel Galvanizing Lines
Round Wire Galvanizing Units
Motor Generator Sets - Copper Oxide Rectifiers

NOTES

on Industrial Health Hazards Connected with Cadium Plating

By PAUL A. NEAL[1], LAWRENCE T. FAIRHALL[1] and K. GUSTAF SODERBERG[2]

THE greatly increased use of cadmium plating for the protection of metal articles, especially in war industries, makes it desirable that information about possible health hazards be disseminated among workers who do cadmium plating and handle cadmium plated articles, and especially among new workers who have no previous connection with cadmium.

While ingestion of cadmium salts through eating and drinking of acid food products which have been in contact with cadmium plated articles has caused a number of cases of poisoning, our present interest is centered around inhalation of cadmium containing dusts and fumes.

The first symptoms are usually dryness of the throat, cough, headache, vomiting and a sense of constriction of the chest. Later symptoms are predominantly referable to the respiratory system and are characterized by cough, pain in chest, severe dyspnea, and prostration. Such severe lung damage usually manifests itself hours after exposure, and cadmium fumes can be breathed in fatal concentrations without enough discomfort to drive the worker away from the exposure.

No extensive study of permissible concentration of cadmium has been made with respect to exposure of human beings. However, American Standards Association in its "American Allowable Concentrations of Cadmium" has accepted as a maximum 1 milligram of cadmium in 10 cubic meters of air.

As a rule, few unsuspected hazards surround the cadmium plating operation itself. Cyanide plating solution is poisonous, and care should be taken that it does not reach the mouth of the operator, either by direct splashing or via his hands. Where insoluble steel anodes are used to plate into deep recesses, or the like, considerable spray

[1] Industrial Hygiene Research Laboratory, National Institute of Health, Bethesda, Md.

[2] Conservation Division, War Production Board, Washington, D. C.

may evolve from the plating tank. In such cases, the tank should be ventilated in the same fashion as a chromium plating tank.

Greater hazards are encountered in operations auxiliary to the cadmium plating operations. In mixing a plating solution, it is imperative that the cadmium containing salts be not inhaled. It is particularly dangerous to burn cadmium. Deaths are recorded as having taken place when a workman has used a blow torch to burn off cadmium plate from inside of tanks and from plating racks. Cadmium should not be removed in that fashion but by electrolytic or chemical stripping. Similarly, plating departments should avoid remelting of cadmium scrap unless assurance is had that the melting equipment is thoroughly ventilated. It is better to send the scrap to the anode supplier, who has satisfactory equipment and knows how to process it.

It is common to heat cadmium plated parts in an oven for the purpose of eliminating hydrogen embrittlement. Such heating requires careful temperature control to the end that cadmium fumes are not formed in the process. Care should be taken that the specified temperature be not exceeded in any part of the oven.

Industrial accidents have recently occurred from welding operations carried out on cadmium coated articles.

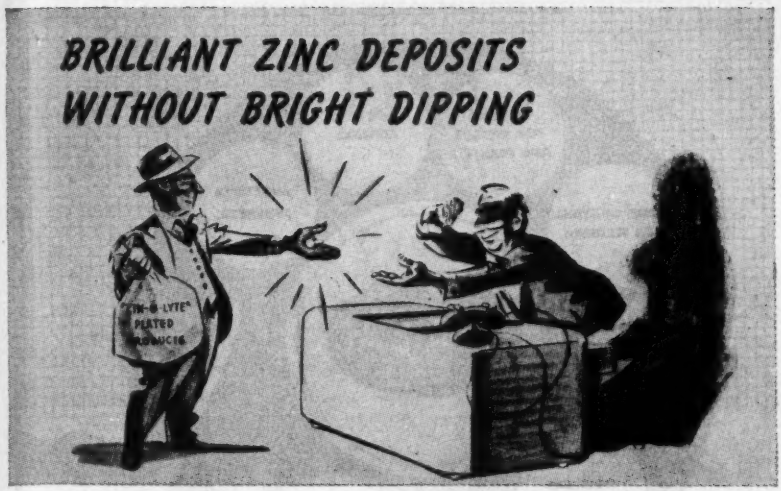
Where cadmium fumes are evolved and space limitations do not permit the use of sufficient ventilation, workmen should be supplied with positive pressure masks. Where acid fumes are also present in the atmosphere, a soda lime cartridge may be attached to the respirator.

There is no record of any cadmium poisoning caused by handling of cadmium plated parts; for example, on the assembly line. It is, of course, a wise precaution to wash the hands before handling food.
August 16, 1944

PROCEEDINGS

In previous years the PROCEEDINGS has been mailed to the members about the middle of September.

Owing to current production difficulties, special binding problems and other unavoidable delays the mailing will not go forward until the early part of November.



Du Pont "Zin-O-Lyte" Zinc Plating

Distinctive, brilliant blue-white zinc deposits closely resembling chromium, are produced directly from the "Zin-O-Lyte" plating bath and *without bright dipping!* In both still and barrel plating, consistent production of very bright deposits without a bright dip is an important essential for practical, economical operation.

"Zin-O-Lyte" solutions are easily made up from prepared salts. Two addition agents used in the process are extremely effective in producing brilliant deposits. One of them also increases current efficiency and widens the bright current density range.

The "Zin-O-Lyte" plating bath may be operated either at high or low current densities with slight changes in composition or operating temperatures—adaptable to individual plant requirements. It can be used for almost all types of ferrous base metals.

The "Zin-O-Lyte" Operating Manual gives complete details about the Du Pont "Zin-O-Lyte" process, tells how it can be used for production of brilliant, low-cost rust-resistant zinc deposits. Send for a copy. E. I. du Pont de Nemours & Co. (Inc.), Electroplating Division, Wilmington 98, Delaware.

Call At
Booth C-110
National Metal Congress
Public Auditorium
Cleveland—Oct. 16 to 20

Drop in at the Du Pont Exhibit to talk over your plating problems, for information about Du Pont plating processes and materials.

Great stars in great radio plays make great entertainment . . . tune in "Cavalcade of America"—NBC Network—every Monday evening

DU PONT
REG. U.S. PAT. OFF.

DU PONT CHEMICALS • PROCESSES • SERVICE
***for* ELECTROPLATING**

BETTER THINGS FOR BETTER LIVING . . . THROUGH CHEMISTRY

THE FINISH YOU NEED
IS AT OUR FINGERTIPS

Regardless of surface—metal, wood, plastic—the finish you seek is in all probability available at a moment's notice. For here in the recesses of our files is a great treasure of practical, proved formulas. The keys to finishes that are doing yeoman service in a host of different applications. Yes, and special coatings, too—for special needs . . . Submit your finishing problem to us. We'll help you solve it—quickly and satisfactorily.

DURALAC CHEMICAL CORPORATION
LISTER AVENUE, NEWARK 5, N. J.

A Halfway Job Doesn't Pay!

. . . Do the Whole Job and Do It Right

Of course, it's important to remove all dirt from the surface of the metal you're electroplating—but a thoroughly clean solution is equally necessary for good plating results. Your plating bath should be as clean as the water used in your final rinse.

DARCO S-51 enables you to keep your plating solution clean, because it quickly *adsorbs* grease, oil, soap, decomposition products, colloids and other impurities. DARCO, the standard activated carbon used in the electroplating industry, prevents unseen contamination or "ghosts" from contaminating metal surfaces—thus saving time, labor and metal.

Many kinds of electroplating — bright nickel, cyanide zinc, cadmium, copper, iron, silver, gold — are now handled more efficiently and economically because DARCO S-51 purifies the plating solution. A few cents' worth keeps 100 gallons of solution clean for a week.

Ask your dealer for DARCO, or write us today for a sample. If you have a difficult purification problem, let us help with it.

This trademark identifies the genuine. Accept no packages without it.

DARCO

DARCO—REG. U. S. PAT. OFF.

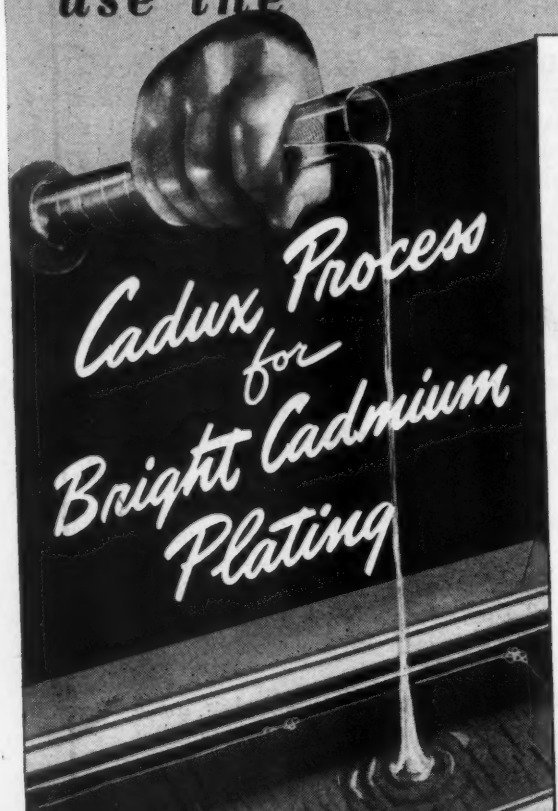
DARCO CORPORATION

60 E. 42nd Street, New York 17, N. Y.

Is Your Plating Bath as Clean as the Water Used in Your Final Rinse?

FOR UNIFORMLY SATISFACTORY RESULTS

use the



THE CADUX PROCESS has over a period of years proved to be one of the most efficient and economical methods of bright cadmium plating. It has enjoyed wide popularity in industry. Although its use now is restricted to essential war work, you may be assured that the Cadux Process will after Victory again be generally available.

Cadux Process is used principally for rust-proofing iron and steel, but it produces excellent results on non-ferrous metals subject to surface tarnish or corrosion. In addition to improving performance characteristics, the silvery-bright deposits produced by this process can add decorative value to parts or products.

H-VW-M Field Engineers will gladly give you complete and detailed information on the Cadux Process. Why not write now and get the facts which may open the way to new and profitable plating results for you?

Manufacturers of a complete line of electroplating and polishing equipment and supplies

HANSON-VAN WINKLE-MUNNING CO.

MATAWAN, NEW JERSEY

PLANTS Matawan, New Jersey • Anderson, Indiana • Bridgeport, Conn.

SALES OFFICES Anderson • Bridgeport • Chicago • Cleveland • Dayton • Detroit • Elkhart • Milwaukee • New Haven • New York • Philadelphia • Pittsburgh • Springfield (Mass.)

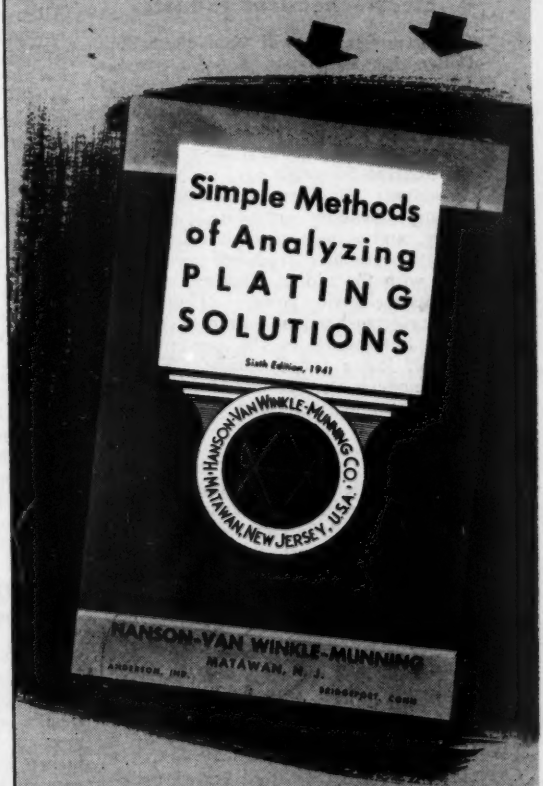
SINCE 1870

WRITTEN for PLATERS
...48 helpful pages

OVER A PERIOD of many years, H-VW-M engineers and laboratory technicians have helped many foremen electroplaters. At the same time, they gained a better understanding both of the plater's viewpoint, and the knowledge required in his work.

Much of what they learned they put in print. The result: a booklet designed to furnish electroplaters in down-to-earth, practical language — just what the booklet's title implies "Simple Methods of Analyzing Plating Solutions." Its 48 pages contain test and tables in easily understandable form with operations numbered and each chemical and reagent given its full importance and consideration.

Write to H-VW-M—Plating Headquarters—for your copy of this valuable reference booklet.



Manufacturers of a complete line of electroplating and polishing equipment and supplies

HANSON-VAN WINKLE-MUNNING CO.

MATAWAN, NEW JERSEY

Matawan, New Jersey • Anderson, Indiana • Bridgeport, Connecticut
Anderson • Bridgeport • Chicago • Cleveland • Dayton • Detroit • Elkhart • Matawan
New Haven • New York • Philadelphia • Pittsburgh • Springfield, Mass. • Syracuse

INDUSTRY NEWS

The Semi-Centennial of the United States - Canadian Electrochemical Industry

Electrochemists will hold their 86th Convention at Niagara-Buffalo, October 12, 13 and 14, 1944, in recognition of the 50th anniversary of the North American Electrochemical Industry. Many products, commercially new, or non-existent 50 years ago, such as carborundum, chlorine, aluminum, phosphorus, Acheson graphite, artificial emery, and numerous high-melting ferroalloys were first produced on a large scale with the aid of Niagara's bountiful hydroelectric power. These and other electrochemical products are of prime importance in the present conquest of Japan and Germany. Without them modern warfare would be impossible—no ships, no planes, no jeeps, no tanks.

The Convention Program includes a session on "Caustic and Chlorine," one on "Electric Induction Heating," one on "Dry Batteries," and one on "Electroplating." It is most gratifying to record the success of the dry battery manufacturers in overcoming all obstacles due to lack of battery-making materials formerly imported from Africa and elsewhere.

Cymboliste Passes

Michel Cymboliste, well known specialist in the electroplating industry, was killed in a tragic accident which occurred at the electroplating factory he had organized in combination with the "Laboratoire Central des Industries Mecaniques," at Caussade.

Mr. Cymboliste is a former student of the Institute of Applied Chemistry of the Faculty of Science of Paris where he graduated in 1924. He went the same year to Etablissements Chenard et Walcker and soon became director of the laboratory. It was there that he carried out, in collaboration with Mr. Albert Portevin, some researches on the mechanism of electrolysis and the control of electrodeposition. He also studied the distribution of electrodeposition of elastic deformation in objects subject to exterior forces while there. In 1928 he became consulting engineer and director of the factory of electrolytic applications of Courbevoie of the Etablissements Bozel et Maletra. He then devoted himself exclusively to industrial electrolysis; his publications on chromium, cobalt and iron deposition are authoritative and have made a well known specialist of him. He had published about twenty papers at the time of his death.

The Society of Civil Engineer of France awarded him the Francois Coignet prize in 1940. At the time of his death Mr. Cymboliste was occupied with some very promising work on electrolytic iron.

Electronics Training Course Prepared by Westinghouse

Designed to give in a clear, understandable manner the basic principles and applications of Electronics in industry, a new ten-part training course covered by sound slide films, lesson books, quiz books, and an instructor's manual has been prepared by Westinghouse.

Although designed primarily for Westinghouse employes, the material has been made available to others at reproduction costs because of many requests from engineering groups and individuals interested in Electronics.

It is recommended that twenty hours should be allowed for the full 10-part course—two hours for each part, with

classes held one night each week, thus giving class members a chance for review and supplemental reading.

Subjects Covered

Subjects covered by the course are as follows:

Part I—Electronics and the electron theory of matter; Electron movement during current flow through metal conductors; Emission of electrons and their controlled flow through vacuum and gases.

Part II—Theory of current rectification by vacuum tubes; Kenotrons—high-voltage, low-current rectifiers.

Part III—How gas in a tube neutralizes space charge; Gaseous rectifier tubes.

Part IV—Electronic amplification.

Part V—Electronic generation of high-frequency alternating currents.

Part VI—Electronic oscillators for radio and carrier current transmission.

Part VII—Basic circuits for electronic control.

Part VIII—Industrial applications of electronic regulation.

Part IX—Industrial applications of electronic control.

Part X—Electronic conversion of light into electricity—and electricity into light.

Material for the Course

Sound slide films and records for the ten lessons give clear, visual explanations of basic theory and applications. (For use with standard sound slide film equipment.) Ten lesson books in handy pocket size, reproducing the subject matter of each lesson, are provided for each member of the class. These afford a convenient means of review and supplemental study. Pictorial quiz books are supplied for mid-course and final review of the subjects covered, and an instructor's manual giving suggested classroom procedure is provided with the complete course. Informative booklets on industrial electronic equipment are supplied covering ignitron rectifiers, high-frequency heating, resistance welding, power line carrier, rototrol, sealed ignitron, and electronic tube data sheets.

Newark Educational Session

The Newark Branch of the A.E.S. wishes to announce that the first open educational meeting will be held at the Robert Treat Hotel in Newark, N. J. on Friday, October 20, at 8 P.M.

Encouraged by the success of similar meetings in the past which were sponsored by Newark Branch, the Educational Committee, under the chairmanship of Mr. Edward Washburn, is endeavoring to furnish valuable and interesting information to the members and friends of the A.E.S. with a view of continuing the successful trend of the electroplating industry.

Well qualified speakers will present the following timely and highly educational subjects:

Frank K. Savage — C. J. Conn, Ltd. Subject — A Preliminary Study of Electro Mechanics by Color Photography.

William F. Phillips — General Motors, Inc. Subject — Future Electroplating and Plastics.

B. G. Daw — LaSalco, Inc. Subject — Automatic Plating Machinery.

H. E. Head — Briggs Manufacturing Co. Subject — Production Anodizing.

It is our earnest desire to continue to promote the welfare of an industry which has proven its true value during these troubled times. Bearing in mind this thought, Newark Branch cordially extends an invitation to those engaged and interested in the science of electroplating to attend this meeting.

W. F. BRUHNS, *Publicity, Educational Committee*

Newark Branch Year Book

The 1944-45 Year Book of the Newark Branch A.E.S. will be ready for distribution on or about October 20.

The material contained in the year book is practical and useful data supplied by various members of the Newark Branch.

This little handbook has rapidly gained in popularity among the men in the electroplating industry in the past several years. Last year the demand from various parts of the country exceeded the supply on hand.

New Gorton Motion Picture

A new 30 minute motion picture — "An Exact Duplicate" — in colors and sound, showing many new techniques in Tracer-Controlled milling, engraving, etching and duplicating has been completed this month by the George Gorton

Machine Company of Racine, Wisconsin.

This motion picture is designed to provide its audiences with short-cut solutions to postwar production problems. It gives production men an opportunity to see Tracer Control at work on actual jobs and to hear simultaneously a description of the work as it progresses. Many of the applications of Tracer Controlled machines shown in "An Exact Duplicate" are similar to jobs now being run in machine shops and on production lines all over the country.

"An Exact Duplicate" required more than a year to produce. It was filmed under the supervision of the same Gorton engineers who developed the Gorton line of Tracer-Controlled machines, and all the jobs shown in the picture were photographed in a machine shop. Excellent application of close-up photography shows all features of work, master and machine. The sound commentary clearly describes each operation and enables even those not familiar with the operation of Tracer-Controlled machines to understand their efficient, time-saving application to these jobs.

"An Exact Duplicate" is available without charge for showing at meetings of technical societies, company groups, etc. All expenses of the showing are borne by the George Gorton Machine Company, Racine, Wisconsin, giving full information and the date showing is desired, together with two optional dates.

National Carbon Co. To Open New Offices

Completing National Carbon Company's new sales set-up under which all company products are to be handled nationally from seven divisional offices, new headquarters will be opened on Oct. 1 in New York, Pittsburgh and Chicago, it is announced. Similar offices were established a few months ago at Atlanta, Dallas, Kansas City and San Francisco.

F. W. Berdan will manage the New York Division. He has been with the company since 1922 and has held executive positions since 1929, for the last several years in New York. The Assistant Division Managers will be G. A. Blackburn and A. B. Oatman. Mr. Blackburn became a salesman in the company's former Carbon Products Division in 1936 and was appointed manager of the Division's New York sales district in 1942. Mr. Oatman came with the company in 1916 and has had an executive sales position since 1939.

J. A. Hammond, who has been with National Carbon since 1923 as salesman and sales executive, will manage the Pittsburgh Division. He became District Manager of the former Carbon Products Division at Chicago in 1930, and since early last year has served at Cleveland as Assistant General Sales Manager of that Division. F. S. Haggerson and W. E. Herr have been named Assistant Managers. Mr. Haggerson joined the sales staff of the former Electrode Division seven years ago after two years in the company's electrode plant at Niagara Falls, N. Y. He became Sales Manager of the Electrode Division in the Pittsburgh District two years ago. Mr. Herr has been with the company as salesman and sales executive since 1922.

Heading the Chicago Division will be H. A. Stewart, who has been with the company since 1919. He has worked continuously in Chicago, first as a salesman and later as a sales executive. Assistant Division Managers will be C. H. Christensen and W. L. Julian. Mr. Christensen began with the National Carbon about 20 years ago and has put in much of his time as a sales representative in the Carbon Brush Division. He was made District Manager of the former Carbon Products Division in St. Louis at the beginning of 1940, going to Pittsburgh as District Manager in August, 1943. Mr. Julian began as a salesman 15 years ago in the Brush Department of the former Carbon Products Division. He shifted to the former electrode division seven years ago, with headquarters in Chicago.

Dow Corning Announces Commercial Availability of Silicones

First commercial production of "Silicones," new organo-silicon polymers, has been announced by Dow Corning Corporation of Midland, Michigan. Development of silicones on a semi-production basis has been in progress for a considerable time. Several of these products are now being made available by Dow Corning for applications essential to the war effort. Dow Corning products include water white fluids for high and low temperature use, electrical varnishes and insulating resins for high temperature operating electrical equip-

ment, and lubricating greases for high temperature and chemical resistant uses. These products, because of their unusual properties, have solved many problems where conventional materials have failed. Very little factual information has been available on organo-silicon products, although their possibilities have been the subject of recent short articles in the press.

Dow Corning Corporation was formed in February, 1943 by Corning Glass Works and The Dow Chemical Company to manufacture and develop silicones more intensively. Corning Glass Works had been conducting research in organic derivatives of silicon for more than a decade. It is interesting to note that this early work was initiated by their research workers because of the advent of glass-like plastics. Since glass is a silicon product, it was believed possible by them that organic derivatives of silicon should yield products having some unusual and valuable properties, perhaps similar in some degree to those of glass.

As so frequently occurs, the research of the Corning scientists led down unforeseen paths. In the course of their investigations water white liquid polymeric silicones were discovered having unusual chemical and physical properties. These materials, which are very interesting from an engineering standpoint, are now available under the name of Dow Corning Fluids. They are manufactured in various viscosities ranging from liquids as thin as water to those which barely flow at room temperature. Their most outstanding property is an exceptionally low rate of viscosity change with temperature, compared to that of previously used liquids. Certain types are made that do not freeze at dry ice temperatures and these same products can be used at temperatures up to 400-500° F.

Obviously the exact purposes for which these materials have been developed cannot be discussed at this time. However, they are now in quantity production and samples together with detailed information on their properties can be obtained from the manufacturer.

Among the other products that stemmed from Corning research are electrical insulating varnishes and resins now available from Dow Corning Corporation. These materials are the culmination of early efforts by Corning research workers to find suitable coating resins for use with glass textiles for electrical insulation or for other purapt to be encountered. In general, none poses where elevated temperatures are of the organic varnishes was substantially better, from the standpoint of heat resistance, than the cotton or paper usually used in electrical windings. Hence there was a definite need for resinous dielectrics that would not decompose and carbonize when electrical equipment was overheated.

Dow Corning silicone resins for electrical insulation extend the range of operating temperatures possible in electrical equipment beyond the limit of thermal stability of conventional organic materials. One of the resins is available as a coating and impregnating varnish which may be applied to Fiberglas cloth, asbestos cloth, asbestos paper and Fiberglas served wire or the like by conventional dipping and drying methods. It requires baking at a temperature of 250° C. for one to three hours to cure to a non-tacky state. Another is an impregnating varnish which sets with heat at 200° C. These materials do not carbonize or darken when subjected to prolonged heating at the curing temperatures. In combination with Fiberglas, asbestos and mica, these Dow Corning impregnating and coating resins permit the design of many types of electrical equipment for higher safe operating temperatures with consequent increase in capacity, reliability, and life performance.

Dow Corning Corporation has a commercial plant under construction at Midland, Michigan that will be in operation later this summer. Its new laboratory and office are completed and in use. Dow Corning officials state that additional organo-silicon products may be expected and will be announced as soon as they become available commercially.

Crown Rheostat & Supply Company Representing Green Electric

Green Electric announces that Crown Rheostat & Supply Company, 1910 Maypole Avenue, Chicago 12, Illinois, are now the exclusive distributors for all types of Green rectifiers in the States of Illinois and Wisconsin. Crown Rheostat & Supply Company will also handle Green rectifiers in several of the adjacent states.

NEW Equipment Materials Supplies

The Udylite Handiplater

The Handiplater is a complete, small size plating unit capable of doing an efficient processing job under regular shop conditions and continuous operation. It is completely portable and can be plugged into any convenient 110 volt, A.C. lighting circuit for power supply. With a few gallons of solution dipped from your regular tank or barrel the Handiplater is ready for service.

The Handiplater is equipped with a removable all-steel plating tub of one-half peck capacity, Koroseal lined and fitted with tumbling ribs at sides for turning parts.

An easily exchanged anode assembly permits the use of the Handiplater with acid or alkaline solutions.

Turco Zinctone

Zinctone, a quick chemical process for brightening and improving the corrosion resistance of zinc alloy die castings is a new development announced by Turco Products, Inc. of Los Angeles and Chicago. The Zinctone process seals the outer "skin" of the casting, helping to protect it from mechanical penetration and corrosive attack. At the same time Zinctone produces a smooth bright surface which compares favorably with the finish produced by mechanical polishing or buffing. The Zinctone process does not change the color of the metal, but brings out a lustrous silvery bloom which greatly enhances the appearance of the casting.

The Zinctone process may be used as a treatment for new castings, and as a method of reclamation for used zinc alloy die casts. The process removes stains and corrosion, seals, passivates, brightens. So thorough is the process that many castings which would have otherwise been discarded may be restored for months of additional service. Carburetors and fuel pumps are typical zinc alloy die casts which may be reclaimed in this manner.

Adaptable to both small shop and mass production set-ups, the procedure makes use of simple, easily available immersion equipment. Already in extensive operation at many Army overhaul depots, the Zinctone process may be handled entirely by unskilled personnel.

Belke Mfg. Co. Issues Folder

A four page folder which illustrates and describes a well rounded line of plating supplies and equipment made or handled by Belke Manufacturing Company of Chicago is being issued, free of charge, to anyone requesting it, along with supplementary pieces which are to follow.

This series is being produced to keep the trade informed as to the equipment and supplies the company has ready for distribution.

Super-R Copper Promat Process by Promat Division, Poor & Co.

A completely new alkaline copper of the Rochelle type, which will deposit copper at greatly accelerated rates in still tank, semi or automatic machines.

Super-R has all the famous Promat characteristics: ductile, buffs easily to high brilliance, and produces an extremely uniform deposit. Super-R Copper is furnished in the form of prepared concentrated Super-R Electrolyte, or your existing Rochelle type electrolyte may be converted for use. The power source is provided by a Promat Kicker which supplies alternating current for

superimposition upon direct current supplied by a generator or rectifier.

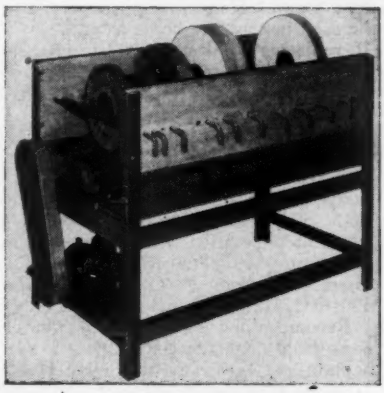
Super-R is a very flexible, easily controlled high speed method of plating copper in Rochelle type baths without the usual operating difficulties inherent with conventional plating.

War-Time Portable Electric Sanding Machine Now Available for Civilian Use

An outstanding "war baby" now in production for civilian purposes is the new Sterling 1000 electric portable sanding machine, manufactured by the Sterling Tool Products Company of Chicago, Illinois. Originally developed to meet military needs, this new electric portable sander is now said to be in great demand for a wide range of civilian uses. Light, durable, adaptable, the Sterling 1000 is designed to replace handsanding methods in a wide range of abrading operations from coarse sanding to lapping and finishing. It is said to provide fast, precise, uniform cutting on wood, metal, plastics and even certain kinds of stone.

A unique feature of this new war-born product is a detachable, flexible sanding pad. Through the use of extra pads which are previously loaded with any type of abrasive, the operator can quickly change from coarse to fine, or the very finest grit, thus avoiding the necessity of stopping work to change the grade of abrasive. The Sterling 1000 is said to be non-vibrating and the pad operates on a new principle of "orbital motion" at the rate of 5,000 oscillations a minute. Because of absence of vibration the machine can be operated with one hand. For descriptive literature and information write: The Sterling Tool Products Company, Department 155-A East Ohio Street, Chicago 11, Illinois.

Polishing Wheel Washer



Divine Brothers Polishing Wheel Washer was designed to save time and effort of polishers, to save wear and tear on diamonds and to avoid irregular cutting of wheels to re-head them.

It extends wheel life by uniform hand removal via the wet method, which is preferred by many polishers. It is particularly adapted to leather-covered wood (strap-faced) wheels. Self-contained, it can be plugged into any electric outlet. Several wheels' heads can be gradually and uniformly soaked off at one time. Immersion of the bottom of the rollers in water makes it possible to apply a thin film of water to each wheel's face so that the abrasive is removed without injury to the wheel body. Wheels of different diameters up to 24" can be separated by inserting wheel-separating rods. The rollers are driven by a ¼ H.P. gear type motor 110/220 volt 60 cycle single phase.

Complete description is available in literature form.

Unichrome Alkaline Stripping Bath Eliminates Need for Critical Chemicals in Metal Stripping

Now that chromic acid and sodium cyanide are under government allocation, platers are making increasing use of Unichrome Alkaline Stripping Bath for removing copper, chromium, cadmium zinc, tin and other electrodeposited metals from steel and cast iron. The

speed and non-etching qualities of this process, as well as the ease of preparation and operation, recommend it as a logical replacement for methods using more critical chemicals.

This process does not etch or pit the base metal. Hence, stripped parts may be used just as they come from the bath. If replating is desired, no mechanical refinishing is needed, with consequent savings in labor, grinding and buffing materials.

Simple preparation is an important advantage of this bath. It is made up by dissolving 2 pounds of Unichrome Strip Salt in water, and adjusting the pH. Stripping is then ready to start. Moderate operating temperatures, from 80° F. to 180° F., involve fewer heat losses. Current densities range from 100 to 175 amperes per square foot.

Recommended equipment is simple, consisting of an unlined steel tank with a plain steel heating coil, together with facilities for rinsing. Ordinary steel or copper electrodes are used, depending on the metal to be stripped. Racks most suitable for plating a given piece of work are suitable for stripping it with this bath.

An outstanding advantage is the nontoxic, non-corrosive nature of the solution. It does not attack clothing or equipment, and gives off no objectionable or injurious fumes during operation. Ventilation is not needed except where high amperages are used. Since the solution is only mildly alkaline and operating temperatures are low, it is less severe on rack coatings and stop off materials than high strength solutions operated at high temperatures.

Detailed information about this process may be obtained by writing to United Chromium, Inc., 51 East 42nd Street, New York 17, N. Y.

Rapid Water Analysis Apparatus

The AERO-TITRATER*, a product of Chief Chemical Corporation, 1123 Broadway, New York City 10, furnishes the plant operator and laboratory technician with a rapid, precise method for the determination of hardness, calcium and magnesium in waters, both industrial and potable. It is also widely applicable to water problems in the process industries.

False endpoints are absent, and air agitation eliminates tedious and arm breaking shaking by hand. The accuracy is comparable with lengthy and laborious gravimetric methods, and substances ordinarily present in water do not interfere at all.

So simple is the apparatus that any operator can readily master its operation. It makes use of a new endpoint, based on the foam-meter principle. This endpoint is unmistakable and is reproducible with a high degree of precision. Determinations are made within ten minutes and there is no waiting time to observe stability of lather. The operation is foolproof and gives identical results with different operators.

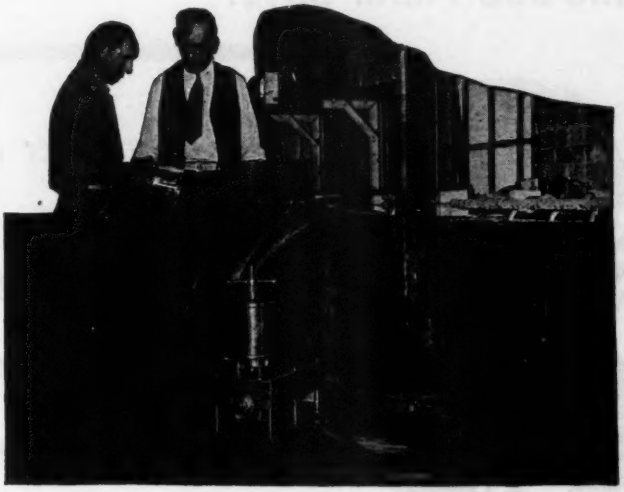
The instrument is supplied calibrated and ready for assembly and use. There are no moving parts to wear out and no delicate features to go out of adjustment. All vital parts are of durable plastic construction.

The AERO-TITRATER is devoid of the inherent and personal errors of conventional hardness analysis procedures. It effectively supplants the standard soap method for all uses, but it does much more—not only is it definitely more precise and rapid, it is also readily usable with waters which resist analysis by the traditional soap method. The ratio of calcium and magnesium present does not affect the determination; there is a single endpoint for stoichiometrically equivalent quantities of calcium and magnesium, regardless of the relative amounts present in the water.

Samples of 50 ml. or less are required. This is in contrast with gravimetric methods involving evaporation of one-half liter or more and subsequent precipitation waiting periods. The apparatus is equally at home in the field and in the plant. Chemists will find it a precision instrument thoroughly reliable in research work of the highest order.

So well does it function in the presence of interfering substances that it can be used directly with samples which contain chlorides up to 2000 ppm. Sulfates up to 1000 ppm are also without effect. Large iron concentrations, and the treating and conditioning chemicals and compounds used in boiler waters do not interfere.

The versatility of the AERO-TITRATER is further demonstrated by the ease with which micro determination of calcium and magnesium in boiler scales, minerals, plant ash, rocks, sediments, and similar materials is made. In many cases these determinations are carried out in the presence of practically all the impurities in the samples. They are simple, accurate and reproducible.



Alsop "SEALED DISC" FILTERS

MAKE PLATING SOLUTIONS CLEAN

Every plating man knows this to be true and he also knows that clean plating solutions mean finer finishes, fewer rejects to be done over again. This low cost filtration pays real dividends.

Alsop "Sealed Disc" Filters are made in portable types for all capacities. Also for all kinds of liquids, Water, Acids, Chemicals, special types for all Oils, etc.

Learn all about this remarkable form of filtration.
We'll send our book. You drop us a card.

ALSOP ENGINEERING CORP.
36 GRAND STREET MILLDALE, CONN.

Joe the Job Plater Says:

Uniform performance of HARSHAW ANODES & CHEMICALS reduced my reject losses

my scrap pile reveals the facts

Joe and other experienced platers know the size of their scrap pile is an unfailing record of good or bad plating results. Platers have found Harshaw Anodes and Chemicals keep their scrap piles at lowest levels . . . indicating plating quality is maintained and profits are up.

Joe has a homely philosophy which speaks volumes about losses through rejects . . . he says: "I can buy scrap cheaper than I can make it."

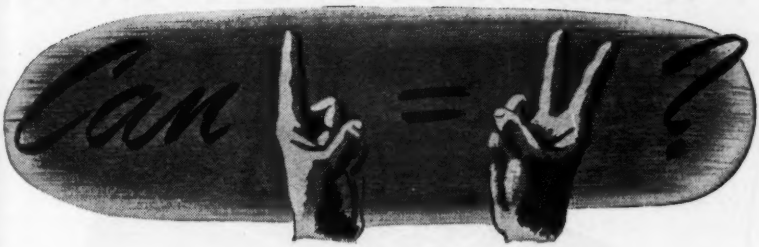
Plating cost records verify the quality of Harshaw Anodes and Chemicals. When you order Harshaw materials for Silver, Cadmium, Zinc, Chromium, Lead, Copper, Nickel, and Tin Plating you are buying the cumulative knowledge and experience of plating engineers and research men whose sole job is to develop anodes and chemicals which keep your scrap pile down and your profits up.

SEND FOR

- **Lead Plating Booklet of Practical Information**
- **32-page book listing Industrial Chemicals**
- **72-page price list of Laboratory Chemicals**

HARSHAW

THE **HARSHAW CHEMICAL** CO.
1945 East 97th Street, Cleveland 6, Ohio
BRANCHES IN PRINCIPAL CITIES



YES...

Deoxidine Cleans and Conditions Metal Surfaces

IN ONE OPERATION

DEOXIDINE removes rust, eliminates or inhibits rust producers — removes light annealing scale, oxides or oil and *leaves the surface properly conditioned to receive a durable paint finish.*

Mathematically one can never equal two, but chemically the DEOXIDINE process does the work of two, combining in one operation both cleaning and conditioning to receive paint finish.

DEOXIDINE is the original phosphoric acid type cleaner and cleans not only the surface, but eradicates the rust and rusters from the pits in the surface, thus insuring the utmost in protection for lasting paint finish.

There are types of DEOXIDINE suitable for use in brush, spray or immersion processes and that may be adapted to removal of varying amounts of grease or rust met with in finishing metal products.

PEROLINE like DEOXIDINE has a two-in-one action. Applied to unpainted surfaces of cold rolled or machined steel, it effectively prevents rusting.

Constituents of PEROLINE react at the same time with the metal to destroy rusters, remove blushes of rust, and create a surface admirably suited for painting when the oil phase left by PEROLINE is removed.

Proved in peacetime and war, DEOXIDINE and PEROLINE have helped speed the production of the more durable material required by our armed forces and our allies. In planning for your postwar fabrication and equipment, we offer the experience of ACP Technicians and the facilities of its well equipped laboratories. They are at industry's call for the solution of metal treating problems.

Manufacturers of Inhibitors & Metal Working Chemicals

AMERICAN CHEMICAL PAINT CO.

AMBLER ACP **PENNA.**

Note—West Coast Plants may address inquiries and orders for prompt delivery to Leon Finch, Ltd., 720 East 59th St., Los Angeles, California

AMERICAN CHEMICAL PAINT COMPANY, AMBLER, PA.

Pease send me general Technical Service Data Sheets on

Name_____ Title_____ ☐ *Deoxidine*

Company_____ ☐ *Peroline*

Address_____ N-10

Pre-Saponified WONDERBAR DOES DOUBLE DUTY

Puritan PUR-BLACK

New, economical, corrosion resistant black oxidized finish that evenly penetrates iron and steel surfaces.

Puritan #550

A comparatively dry bar that does not leave excessive grease. Cuts and colors in one operation before chrome plating precision parts.

Puritan H-T-S

Puritan's new high temperature salts developed for complete removal of scale from iron, steel, monel metals and alloys after heat treatment.

You can cut your buffing and cleaning costs in half when you use the *original* PURICO WONDERBAR. This patented, *pre-saponified* Tripoli Buffing Composition *cleans while it buffs* through the special qualities introduced by pre-saponification and eliminates manual scrubbing operations . . . its finer composition thoroughly removes greases and other foreign matter yet may be easily rinsed from the most intricate recesses.

Write for Sample Demonstration or Descriptive Booklet

Start with a Good Finish

THE *Puritan* MANUFACTURING COMPANY

WATERBURY, CONNECTICUT

NATIONAL DISTRIBUTORS

E. H. BUTCHER CO.	Los Angeles
JACOB HAY COMPANY	Chicago
REYNOLDS-ROBSON CO.	Philadelphia
SESSIONS-GIFFORD CO.	Providence
W. D. FORBES	Minneapolis

RESEARCH COMMITTEE

The Research Committee under the chairmanship of Mr. C. E. Heussner is renewing its activities, and at this time it seems wise to review the work which had to be stopped because of war conditions and determine whether or not it should be continued. It also seems wise to get the opinion of various members of the Society on possible subjects for investigation to have as much information available before the Committee as is possible when the decisions are made.

Below is a form of Questionnaire which has been prepared by the Research Committee and it is suggested that each branch discuss the matter of research work at the branch meeting, and any concrete suggestions which come out of this discussion be prepared and sent to the Research Committee following the outline given. All information which has a bearing on the matter should be included, and if additional information is to be submitted it can be submitted in the form of attached sheets.

The Questionnaire is being sent to each Branch Secretary, and it is hoped that replies will be received during the month of October so that the Committee can make their decisions and start work as soon as possible.

QUESTIONNAIRE FOR SUBMISSION OF PROBLEMS TO A. E. S. RESEARCH COMMITTEE BY THE MEMBERS, THROUGH THEIR RESPECTIVE BRANCHES

I. *Submitted by*:
   Branch
   Members

II. *Date Submitted*:

III. *Object of proposed investigation*:

IV. *Brief Statement of Problem*, indicating why known or existing methods or information are inadequate:

V. *Statement of the importance to the A. E. S. and Industry*:
   1. Approximate percent of members interested.
   2. a. Where used in industry?
      b. For what purpose?
      c. Extent of its use?

VI. *Brief summary of what has been tried, if data is available*:
   1. Are particular base metals and/or alloys involved? If so, name them.
   2. Describe surface conditions of base metals as received for processing with respect to following, if these details are pertinent to the problem:
      a. Kind of scale, oxide or surface contamination.
      b. Conditions of heat treatment and quenching as to type, time, temperature, etc.
      c. Surface treatment such as shot blasting, polishing or buffing, if any, giving details as to grain sizes, kind of compositions, wheel types and speeds, grease stick and sequences employed.
   3. Describe preliminary cleaning cycle, if pertinent to problem, giving detailed information as to kind of cleaning, (i.e. solvent, alkali acids), composition, concentration, temperature, time, pH, current conditions and sequence of operations employed.
   4. Give complete information on the composition, concentration and conditions of operation for any processing bath involved, indicating treatment time, coating thickness, temperatures, current conditions, pH, filtration practice, purification practice, agitation as to type and severity, and impurities present as to kind and amounts.
   5. *Specifications for product*:
      State what tests, if any, have been employed.
      State what test values have been obtained.
      State what test values are desired.
      Give details as to where information can be obtained on any special tests involved.

VII. This questionnaire must be submitted in duplicate through the Branch to the Executive Secretary, E. T. Candee, P. O. Box 791, Waterbury 88, Conn.

LIST OF AVAILABLE SPEAKERS—1944

Representing	*Speaker*	*Subject*	*Locality*	*Expenses*
G. B. Hogaboom, Jr. & Co.	Nathaniel Hall	Heavy Industrial Deposition & Electforming	East	Company
Udylite Corporation	R. B. Saltonstall	Unannounced	Middlewest	"
Electric Products Co.	F. K. Rouge	Motor Generator Sets & Plate Rectifiers for Electroplating	Any except West	"
" " "	G. J. Berry	"	"	"
Harshaw Chemical Company	Paul Pine	Lead-Tin Alloy Plating; Dies for Die Casting.	Dayton, Buffalo, Pittsburgh & Cleveland	Company
" " "	G. H. Merz	"	Rochester	"
" " "	James Spencer	"	New York City and New England	"
" " "	R. Seman	"	Baltimore-Washington	"
" " "	Oscar Meline	"	Chicago, Milwaukee, St. Louis	"
" " "	H. E. Nice	"	Cincinnati, Dayton, Philadelphia	"
Sulphur Products Company Inc.	Lawrence J. Durney	Copper Stripping	East	"

The Du Pont Company has listed the following men who are available for the particular districts shown:

Sulphur Products Company Inc.	Lawrence J. Durney	Copper Stripping	East

The Du Pont Company has listed the following men who are available for the particular districts shown:

Name	*Territory*	*Speaker to be contacted at*
H. H. Blouch	Michigan	Du Pont Company, 1530 E. Hancock, Detroit, Michigan
L. J. Schustik	Chicago, Northern Ill. & Wisconsin	Du Pont Company, Chicago, Illinois
H. W. Kennedy	Cleveland—west to St. Louis	Du Pont Company, 1226 Guardian Building, Cleveland 14, Ohio
E. C. Friedl	Cleveland—east to Pittsburgh	Du Pont Company, 1226 Guardian Building, Cleveland 14, Ohio
D. W. Hill	Western New York	Du Pont Company, Niagara Falls, N. Y.
W. J. Schneider	Eastern New York, Philadelphia, Baltimore & Washington	Du Pont Company, Empire State Building, New York City
R. H. McCahan	New England	Du Pont Company, 140 Federal Street, Boston 10, Massachusetts

The following speakers are available from Du Pont Laboratories:

R. O. Hull	Any	Du Pont Company, Grasselli Experimental Laboratory, Cleveland, Ohio
H. L. Benner	Any	Du Pont Company, Electrochemicals Department, Niagara Falls, New York

The Du Pont Company will pay expenses of their own men.

"The trend is to PENTRATE"

Huge quantities of war materials have proven the worth of Pentrate as a durable steel finish. The rich black "quality-look" of Pentrate has sales appeal in addition to its rust resistant and friction reducing characteristics. Send for our Pentrate booklet — it will pay you to investigate this economical, low temperature finish for steel.

HEATBATH CORPORATION

SPRINGFIELD • 1 • MASSACHUSETTS

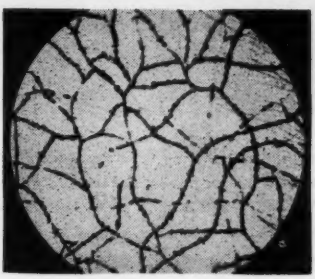
EWS OF POROUS CHROMIUM

and the Great Job it's Doing!

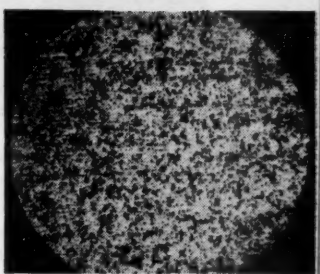
GHLIGHTS
UNITED
ROMIUM'S
STORY

Thousands of cylinders for diesel, aircraft and other internal combustion engines are being plated today by and for the U. S. Government under United Chromium license—making possible valuable improvements in functional operation, as well as greatly increased service life.

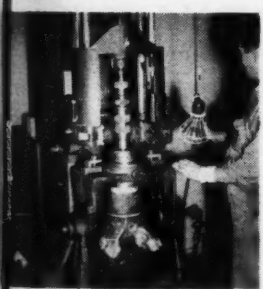
vital consideration in utilizing porous romium to best advantage is the type of rosity best suited to the part in question. ained Chromium's pioneering research in es of chromium plating is of particular nce in determining the most satisfactory n at each stage of processing.



3 Deposit of the chromium plate, for example, calls for close coordination and control of the bath composition, temperature and current density. "Channel" type porosity, shown in microphotograph above, is generally specified for aircraft cylinders.



4 Type and degree of porosity is determined only after careful study of the conditions under which the part will operate—with respect to fuel, lubrication, cooling, etc. "Pitted" type porosity, shown in microphotograph above, is frequently found most desirable for diesel liners.



he final finishing operation is important. his usually involves honing—special attenion being given to the amount of plate reoved, the rate of cutting and final cleaning.

6 United Chromium assists its licensees by furnishing detailed information for each step in the procedure—from the time work is received to the final inspection.

HOW POROUS CHROMIUM IS MADE AVAILABLE

United Chromium offers engineering and technical assistance—from specifications and layouts for equipment to analysis and maintenance of solutions—which assists our licensees to put their installations into prompt and efficient production. We will gladly furnish interested manufacturers with information as to how POROUS CHROMIUM can be adapted to their needs. In writing, please give us such pertinent information as the size and number of pieces to be plated, composition of the basis metal and the service conditions to be encountered.

NITED CHROMIUM, INCORPORATED

rbury 90, Conn. **51 East 42nd Street, New York 17, N. Y.** Detroit 7, Mich.

NOW!
GENERAL CHEMICAL OFFERS
A 50% SOLUTION OF
LEAD FLUOBORATE
...and at a new low price!

The widespread acceptance by platers of General Chemical Lead Fluoborate has made possible the offering of a *50% solution*, and *at a new low price* . . . a price that will make a real difference in your lead plating costs!

Platers find this solution saves time and labor because of these extra advantages: dilutes simply with water—high concentrated strength—requires no filtering, sediment-free—a standardized composition—uniform and unvarying.

REPLACES SCARCE PLATING METALS!

General Chemical Lead Fluoborate makes a superior plating bath and its use conserves many war-scarce metals. The special chemical and physical properties of the lead plate provide useful characteristics not obtainable with other plating metals . . . for example, it plates directly on steel and cast iron.

Today, Lead Fluoborate fills a vital war need in metal plating—and may offer a solution to *your* plating problem! Write for prices and new Technical Service Bulletin which contains complete data. Use the coupon below.

AIRPLANES DEPEND ON LEAD PLATED ENGINE BEARINGS! Motor and bearing manufacturers find lead fluoborate saves time and releases scarce labor for other vital jobs.

OTHER SUCCESSFUL APPLICATIONS! To prevent corrosion by moisture, acid, salt-spray, etc., manufacturers are using General Chemical Lead Fluoborate Solution to plate battery parts, gears, nuts and bolts, and various other metal parts

OTHER FLUOBORATE SOLUTIONS

Cadmium Fluoborate
Chromium Fluoborate
Copper Fluoborate
Ferrous Fluoborate
Indium Fluoborate
Nickel Fluoborate
Silver Fluoborate
Stannous Fluoborate
Zinc Fluoborate

GENERAL CHEMICAL COMPANY

...FIRST IN FLUORIDES

GENERAL CHEMICAL COMPANY
40 RECTOR STREET, NEW YORK 6, N. Y.

Technical Service Offices: Atlanta • Baltimore • Boston • Bridgeport (Conn.) Buffalo • Charlotte (N. C.) • Chicago • Cleveland • Denver • Detroit • Houston Kansas City • Milwaukee • Minneapolis • New York • Philadelphia • Pittsburgh Providence (R. I.) • St. Louis • Utica (N. Y.)

Pacific Coast Technical Service Offices:
Los Angeles • San Francisco • Seattle, Wenatchee and Yakima (Wash.)
In Canada: The Nichols Chemical Company, Limited • Montreal • Toronto • Vancouver

GENERAL CHEMICAL COMPANY • 40 Rector St., New York 6, N. Y.

Gentlemen: Please send me without obligation prices and technical information on Lead Fluoborate Solution.

*Name*_____

*Position*_____ *Company*_____

*Address*_____

*City*_____ *State*_____

Here's Your Answer

Twenty years of building better tanks have left our files replete with valuable tank welding data.

YOU can depend on Storts engineering staff for sound counsel in the planning of new tank installations — designs to assure efficient operation — selection of materials to resist corrosion of every kind. Storts-welded construction gives further assurance of leakproof joints and long life utility values. Mark tank areas on your floor plan and leave the rest to Storts. It's the simple and sure way to satisfaction.

STORTS WELDING COMPANY

42 Stone Street Meriden, Conn.

Manufacturers of Welded Fabrications to Specification

BRANCH NEWS

Business and Social News • Educational Activities

DAYTON BRANCH

The Dayton Branch held the September meeting on the 8th at the Engineers' Club. During a short business meeting the branch voted a sum of money to maintain the Proctor Award.

The paper was given by Herman E. Austen of the National Cash Register Company. It dealt with the application of the aceticperchloric acids electropolishing bath in polishing, finishing, and deburring of steel parts. Examples of large savings in deburring were described and also special problems which were overcome by the use of the solution.

W. M. DURNBAUGH, *Sec'y.-Treas.*

JACKSON-LANSING BRANCH

The Jackson-Lansing Branch started its 1944-45 season on September 12, with a dinner and program at the Home Dairy in Lansing. Approximately 115 were at the dinner.

President C. E. McDowell opened the meeting with a few remarks and then introduced the chairman for the evening, Mr. R. W. Redman. Mr. Redman gave a short discussion on membership in the A.E.S., pointing out the benefits derived from an organization of this kind. The chairman, then introduced the speakers of the evening, Mr. Cameron H. Bell and Dr. Robert Wysocki, both of Forbes Varnish Co., Cleveland, Ohio.

The subject of Mr. Bell's paper was "Specification Finishes." The various government specifications for paint finishes were discussed and the outstanding points explained. Mr. Bell presented a very fine paper on a rather confusing subject.

Dr. Wysocki presented a paper on "Paint Baking Methods and Equipment." This was an extremely interesting paper. All types of heating paint baking ovens were explained very thoroughly together with a description of the equipment required. The advantages and disadvantages of the various methods of baking paint finishes was brought out.

A discussion by the members followed each paper.

The meeting was then adjourned.

C. E. TOPPING, *Sec'y.-Treas.*

NEW HAVEN BRANCH

The opening meeting of the current year was held by the New Haven Branch on September 12, 1944 in the Hotel Taft. A large gathering of members was present, including President Art McNeil of the Bridgeport Branch and Jack Buckman of the Springfield Branch, also quite a few "old timers" of our branch, Jack English, John Oberender, Henry Creamer, Robert Mooney, Joe Cooke and Jack Barry.

As the pressure of war production decreases a little, we hope to see attend, Joe Sexton, Tom Chamberlain, Al Rosenthal, Joe Sheridan and Doc Egeberg.

President Walter T. Lynch opened the meeting and requested a roll call of officers.

The President discussed with the members various plans for the coming year and their opinions asked regarding future dinner meetings, topics and speaker.

He announced the next monthly meeting will be held on October 17, at the Sterling Laboratory of Yale University and introduced the speaker of the evening, Mr. Lester K. Burton of the General Electric Company.

Mr. Burton spoke on "Rectifiers" and their value to the theatrical and finishing industries. Using a blackboard, Mr. Burton illustrated the fundamentals of electricity, sketching various parts of the rectifier, showing samples he had with him and speaking of personal practical experience. He gave the members an extra fine educational evening. After

a very active discussion on the advantages and limitations of the subject, Mr. Burton was given a very hearty vote of thanks by the members.

Meeting adjourned at 11:30 P.M.

B. J. GAFFNEY, *Secretary*

PHILADELPHIA BRANCH

The officers of Philadelphia Branch A.E.S. met at the home of George Long, Willow Grove, Pa., Tuesday, September 19, 1944.

President Zurbach called the meeting to order with the 1st and 2nd Vice-Presidents and a member of the Board of Managers absent.

The applications of Charles W. Parker, active, and Samuel E. Garritano, active, were referred to the Board of Managers.

The communication of Supreme 2nd Vice-President Frank K. Savage was read, noted, and turned over to 2nd Vice-President Burden as chairman of the membership drive.

Librarian Hirsch was notified by Nat Verrelle of the Entertainment Committee to prepare for a dinner speaker in November.

On the third Friday of September, 1944, Philadelphia Branch A.E.S. sat down to a dinner with 50 members and guests present at the Broadwood Hotel.

After dinner the meeting was called to order by President Zurbach. Motion made and carried that the reading of the minutes and all business be dispensed with; President Zurbach turned the gavel over to Librarian Hirsch, who introduced the speaker of the evening, Art Logozzo, whose subject was "Hard Chrome."

The speaker had the floor for an hour and a half with many questions as the illustrated slides were shown.

As a matter of fact, it was more of a round table discussion with Art at the head of the table.

The speaker received a rousing vote of thanks.

Mr. Hirsch then introduced the next speaker, Dr. Graham, representing the Research Committee of the A.E.S., who spoke on the aims of the Committee and indicated the various paths of research to be followed and the expected amount of the fund.

Quite a sum was subscribed and noted, the subject of the Branch Chairman of the fund to be taken up at a future meeting.

Dr. Graham received a vote of thanks, and the meeting adjourned at a late hour.

PAUL MENTZER, SR., *Secretary*

MILWAUKEE BRANCH

The Milwaukee Branch held its first meeting of the season on Sept. 8, 1944, at the Republican Hotel. After the usual business meeting had run its course, Mr. William Geissman and Mr. Phil Ritzenthaler went over the high lights of the educational session at the Cleveland convention. They did a very fine job of reviewing and I'm sure those men present who did not attend the convention gathered some valuable information.

The following men made application for membership in the Milwaukee Branch: Mr. Silas W. Koeser Jr., active, 220 Cedar St., Green Bay, Wis., Mr. Clarence E. Bradley, associate, 3612A N. 21st St., Milwaukee, Wis., and Mr. George A. Krause, active, 1931 Winnebago St., La Crosse, Wis.

If the large turnout for this meeting is any indicator of the future, we shall have a fine attendance and fine meetings through the year.

JAMES DURNFORD,
Secretary

HARTFORD BRANCH

The Hartford Branch opened its 1944-45 season Monday night, September 18, at the City Club in Hartford. The meeting was held jointly with the ASM and the arrangement proved a great success. Members of both societies expressed a desire to have such a joint meeting become an annual affair. Dinner at 6:30 was enjoyed by 42 members and guests. The attendance at the technical session was about 120.

The business meeting was called to order by I. Laird Newell, Librarian, who presented the program of speakers the Hartford Chapter has obtained for the coming year. He also welcomed the ASM and introduced their chairman Mr. DeVon W. Fryback. Mr. Fryback spoke a few words to the joint gathering and read the list of speakers for the ASM for the ensuing year.

Mr. George B. Hogaboom then gave a short talk on Latest Developments in

the Finishing Industry. This is a new feature introduced this year and will be presented at each meeting by Mr. Hogaboom.

Art Logozzo, technical chairman for the evening, then introduced the guest speaker, Mr. John Poor, of the Van der Horst Corporation, whose subject was Porous Chromium. Since Johnny was originally a member of the Hartford Branch, this was a home-coming for him which was looked forward to by many of his former associates in and around Hartford. Mr. Poor covered his subject well and was besieged with questions when he had finished.

Members and guests expressed their appreciation of Mr. Poor with a rising vote of thanks. The meeting was adjourned at 10:00 P. M.

F. W. SMITH,
Secretary

PITTSBURGH BRANCH

The Pittsburgh Branch held their first Fall meeting Thursday, September 14th, at the Roosevelt Hotel. Dinner was served at 6:30 P.M. There was a fair turnout to hear Mr. Floyd Oplinger of du Pont speak on "Ideas on Post War Electroplating Developments."

Mr. Oplinger said his whole talk could be summed up by saying that plating after the war will substantially be the same as before the war. There have been some interesting developments and improvements, however, during the past two to three years.

1. There will be more plating to specifications and those specifications will call for substantially heavier coatings.

2. Silver plating has undergone one of the major changes in the past two years. This is due to the plating of aircraft engine bearings. Plating speed is 10 to 20 times as fast as it was a few years ago. The development, however, has been one mostly of technique and equipment with about the same solution with the exception of higher concentrations and the use of potassium instead of sodium.

3. Potassium is largely supplanting sodium in cyanide plating solutions. The reason for potassium working better is not entirely known, but it is more stable and the corresponding carbonate is less troublesome.

4. Purified water obtained by the ion exchange system has found important uses in the plating solutions and rinses. It is made by the cation and anion exchange in resin salts which can be purified by sulphuric acid and soda ash.

5. Tin plating has made enormous strides during the past two years. This advance has been mostly technical.

Following Mr. Oplinger's talk there was an extended and lively discussion of the subjects mentioned by Mr. Oplinger and a rising vote of thanks was extended Mr. Oplinger for his talk.

The business meeting followed the paper and discussion.

Minutes of the previous meeting last May were read and approved.

Dr. Lancy reported on the Cleveland Convention. Since nearly everyone at the meeting was at the Convention the report dealt mostly with our receiving the Convention bid for 1945. Mr. Johnston, our President told of the business meetings this summer and the preliminary work that has been dore in preparation for the Convention. Committee Chairmen have been appointed with Mr. Johnston General Chairman. He was appointed by the Board of Managers.

It was decided to hold our meetings this year the first Thursday of each month at the Roosevelt Hotel. Dinner will be served at 6:30 P. M.

Our desires for speakers this year were discussed, and it was suggested speakers be selected at least two months in advance of the meeting. Some of the suggestions for speakers were:

1. A speaker from Batelle such as Dr. Faust.
2. Ion exchange in water treatment by Illinois Water Treatment Company.
3. Wm. Phillips of General Motors.
4. Zinc plating of strip.
5. Forum with three good men to answer questions.
6. Silver plating.

Mr. Dimon requested to be relieved of his duties as Second Vice President since his duties as Librarian for the Branch and the Convention would take so much of his time. Mr. M. A. Pederson was elected as Second Vice President.

Mr. Hennessy requested to be relieved of his duties as Entertainment Chairman due to his two years service in that office. President Johnston appointed Mr. Joseph Wray as Entertainment Chairman for the coming year.

The Branch decided to continue the service of the Pittsburgh Technical Cal-

endar which sends notices in calendar form to all the Technical Societies of the various Technical Meetings each month.

The meeting was adjourned at 11:00 P. M.

FRANK R. KELLER,
Secretary

SYRACUSE BRANCH

The Syracuse Branch had a regular meeting on Friday, Sept. 15, in Bowne Hall, Syracuse University. The meeting was opened at 8:00 P. M. by Dr. N. F. Murphy, our President.

The minutes of the previous meeting were omitted due to the fact that the previous meeting of the Syracuse Branch had been a dinner meeting.

There was some discussion concerning the new type membership committee as outlined by Mr. Jack Bain in a letter to the secretary. It was decided to obtain a sample of the new form before entering an order for certificates for all the members of the Syracuse Branch.

The speaker for the evening was Mr. W. J. Schneider of E. I. du Pont de Nemours & Co. Mr. Schneider discussed the new "Potassium High Speed Copper Plating Bath." The advantages of the potassium bath as compared with the sodium bath, the concentration and conditions of operation of the potassium bath, the nature of the deposit and the rate of deposition were all outlined. The post war applications of the process were especially stressed. The interest of those present was shown by the great number of questions which were put to Mr. Schneider in the ensuing discussion period.

Just before the closing of the meeting, Dr. N. F. Murphy announced that a course in electrochemistry would be offered at Syracuse University which would cover electro-plating and solution analysis.

NEIL C. MAFFEI,
Sec'y-Treasurer

TORONTO BRANCH

The first fall meeting of the Toronto Branch was held in the Royal York Hotel, September 8 with President Byers in the chair. President Byers welcomed the members and promised them a speaker at every meeting until the end of this fiscal year.

Mr. Harry Hands acted as secretary in the absence of Secretary Creighton; letters were read from Mr. H. Failess, Mr. Schor and Mr. Jack Bain. The application of Mr. John McRoberts was balloted on and elected into membership.

The branch activities for the remainder of the fiscal year were discussed and plans for the annual card party, bowling party and perhaps and educational session and dance were discussed. Members were elected into two committees comprising Messrs. Fitzsimmons, Armstrong, Boaz, O'Keefe, Graham, Price and Byers. With a combination like that Toronto Branch will go places.

Under good and welfare, Mr. Walter Barrows was called upon to give his report of the Cleveland Convention and for 65 minutes the members listened to a real Barrow's report of the platers' convention that was complete in every detail.

Question in the question box:

Q. Is there a brightener for alkaline tin Sol?

A. The members did not know of any.

Meeting adjourned at 10:30.

JAMES S. CAIRNS
Acting Secretary

LANCASTER BRANCH

The Lancaster Branch of the A. E. S. started its 1944-45 season with a dinner meeting at the Stock Yard Hotel. The meeting was a testimonial dinner honoring one of the oldest platers in the vicinity, Mr. J. Walter Miller. After the business meeting Mr. C. Brubaker read a brief history of Mr. Miller's life in the plating field.

Mr. Miller was born September 7, 1867 at Middlesex, Cumberland County, Pa. He attended the public schools and was a high school graduate. He was very much interested in chemistry and electricity as a boy and at the age of 17 his interest turned to electroplating.

Mr. Miller's early struggles and experiences were outlined. He started business in Lancaster in January 1887 and has conducted a plating and foundry business there since. He is still actively engaged in business.

After this brief resume of his life and experiences Mr. Miller answered the various questions put to him by the members.

WILLIAM H. FORDNEY,
Secretary

ROCHESTER BRANCH

The Rochester Branch of the American Electro-Platers' Society held its first fall session on September 15th, 1944 at 8:00 P. M. at the Hotel Seneca.

President John Adams opened the session at 8:15.

The minutes and treasury report for the previous meeting were read and approved. Communications were read concerning the activities of other branches on the problem of membership. An application for associate membership was accepted for publication for Sam Chipallo of Sampson United Corporation.

President John Adams gave a charge to the members about attendance. He said, "Last year the Rochester Branch had one of the best educational programs that could be obtained, through the efforts of our educational chairman, Mr. Tucker. But, very little response regarding attendance, toward the speaker and his company, was shown by our members.

"We will again this year, attempt to bring speakers to Rochester, providing the members take enough interest to support such men as Mr. Logozzo, Mr. Diggins, and many others who are only too glad to answer our many questions."

The meeting was then turned over to Mr. Tucker, who gave a full report of the questionnaire regarding meeting place, time and type of program, for the coming year. The meeting place will be the Seneca Hotel, on the third Friday of every month at 8:00 P. M.

The type of program was laid out by following the questionnaire, and votes on the various subjects by the number present.

(1) Chrome plating
(2) Nickel plating (bright)
(3) Copper—Dull and Bright

They will be presented by out of town men, as mentioned previously.

The meeting adjourned at 10:00 P.M.

DONALD C. BLUM,
Secretary-Treasurer

NEWARK BRANCH

The regular meeting of the Newark Branch of the A. E. S. was held at the Robert Treat Hotel, Newark, N. J. on August 18, 1944. In the absence of our President and Vice-Presidents, Mr. Paul A. Oldam was appointed to the Chair and he officially opened the meeting at 9 P. M. Other officers present were: George Wagner, Sec'y-Treas.; Ed Washburn, Librarian; Horace H. Smith and William Bruhns, Board of Managers.

A communication from Walter Pinner was read and turned over to our Librarian.

A bill from Lont and Overkamp was presented for payment.

A report on the progress of the Year Book was made by the Educational Committee.

Our Librarian, Ed Washburn, conducted a question box on "Chromate Finishes" and gave a talk on a new method which he developed for testing Chromate Solutions. This method will be published in the Newark Branch Year Book.

Twenty-seven members attended this meeting which was adjourned at 10:45 P.M.

GEORGE WAGNER,
Secretary

CHICAGO BRANCH

The Chicago Branch of the A. E. S. held its regular monthly meeting Friday, September 8th, at the Atlantic Hotel. President R. J. Hazucha presiding and all other officers present.

The applications of Paul Glab and Howard Conrad were elected to membership. New applications were received by C. T. Dostale, S. Wray Jr., L. Humphry, and R. Towner.

O. J. Bedard was reinstated to active membership.

Our Librarian C. W. Carter introduced Mr. Roy Nielsen of the Pittsburgh Plate Glass Co., who gave a very interesting description of the use of glass tanks in the plating industry. Mr. Nielsen was given a rising vote of thanks after answering many questions.

The following questions were in the question box.

1. What method can be used to entirely eliminate glue from an acid solution? Activated carbon has failed.

Answer. Filter paper was suggested, also the Liscomb method of purification followed by carbon treatment.

2. What is recommended for bronz colored plating?

Answer. A solution composed of copper 2, Zinc ½, free cyanide 2 oz./gal., pH 9.8, 140 deg. F., 15 amp./ft. sq.

3. What is a good muriatic acid tank lining?

Answer. Rubber covered over inside and outside of tank.

The meeting adjourned at 10:00 p.m.

M. H. LONGFIELD,
Secretary

WATERBURY BRANCH

Waterbury Branch held its first meeting of the 1944-45 season, Friday, September 8th at the Hotel Elton. This meeting was designated to honor our past Presidents and we were pleased to have as our guests at dinner and for the meeting following, eight present out of ten. Unfortunately Barrie Hackett living at some distance could not make this meeting, but sent greetings to the Branch, while Tennant Elwin really had to help his wife celebrate their wedding anniversary.

Tony Maz, our new President opened the meeting with several announcements. Bridgeport Branch is holding its annual picnic on September 9th and have published their program through January, containing a list of speakers which should attract many from Waterbury.

George Hogaboom called attention to an important meeting which the Hartford Branch is holding September 18th at the City Club. There is no doubt that a number of Waterbury members will wish to hear John G. Poor talk about porous aluminum. Mr. Poor, well known in Connecticut, is now Electrochemist at Van Der Horst Corp.

After these announcements, George Hogaboom conducted the rest of the meeting. In 1921 Waterbury Branch was organized, when thirty-one platers gathered together and elected Mr. Hogaboom president. Difficulty was encountered in obtaining a charter from the supreme society but after persistent effort the Branch was finally legally established and has continued to grow in number and expand its activities ever since. It was indeed a pleasure to hear Mr. Hogaboom picture these early years and to hear from each subsequent President in turn, his impression of the change, the growth and the improvement in the scope and work of the Branch.

As has been our custom for several years past, our speaker for this meeting had a subject quite far afield from electroplating and then again perhaps not so far afield, because, normally, Connecticut produces many thousands of dollars worth of equipment for the sport of fishing and for this equipment the electroplater must produce corrosive proof and decorative coatings.

It was with pleasure and pride that the Branch presented Mr. Francis L. Sheane, Chairman of the State Board of Fisheries and Game, as the guest speaker of the evening. Mr. Shean's subject was "Improvement of Fishing in Connecticut Lakes and Ponds." His audience was surprised to learn that Connecticut now has so many anglers, that our brooks and streams, under normal conditions, would support fishing for only one-half day, hence the necessity for stocking with trout each season.

It also was surprising to learn that Connecticut has over one thousand lakes and ponds which in themselves are much the same as they have always been. Of course their recreational facilities have been enlarged and exploited, but for fishing they remain much the same and they can provide a real harvest of food, as well as sport. But pond fishing has deteriorated and strangely enough, due to a large extent to the fish and game laws which were made to protect it. Limiting the size and take of certain fish particularly of fish such as white perch which were artificially stocked and are normally foreign to these waters, has increased the number so greatly, that they are now all small in size and the larger game fish are crowded out. Copper sulphate, used a number of years past to prevent the formation of green scum during the summer, destroyed the food on which the fish live.

The Fish and Game Commission is now seeking to correct these conditions by tailoring restrictions to fit the need of each body of water. Thus, for example, in the few lakes which support trout, warm water fish may be taken without restriction so as to provide living space for the more desirable trout. Lakes overrun with perch have no limits on these undersirables, but the pickerel and bass are rigidly controlled.

Research has shown that fertilizing increases growth of plant food upon which fish feed, so after the war the State will carry out such a project.

The ultimate aim is to have two hundred thousand acres of State-owned property devoted to wild life with the idea of making this a better place for our technicians and skilled workers to live in.

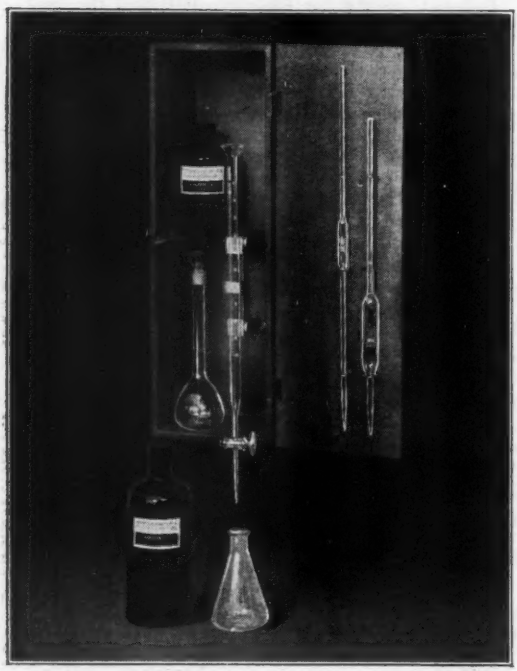
The program was concluded with the showing of the 1944 Convention pictures sponsored by the Lea Mfg. Co. And finally beer and sandwiches were served winding up the evening with an informal social gathering.

SPENCER L. HENN,
Secretary-Treasurer

FOR SALE Available for Immediate Shipment

1—4000/2000 AMPERE, 6/12 VOLT, **HANSON & VAN WINKLE COMPANY** "INTERPOLE" DESIGN Motor Generator Set. Separately Excited. Complete Control Equipment.
1—3000/1500 AMPERE, 8/16 VOLT, **CHARLES J. BOGUE ELECTRIC CO.** Motor Generator Set, (practically new). "INTERPOLE" DESIGN. Separately Excited by Motor Generator Set. Complete Control Equipment.
1—3000/1500 AMPERE, 5/10 VOLT **CHARLES J. BOGUE ELECTRIC CO.** Motor Generator Set. Separately Excited. Full Control Equipment.
1—2500/1250 AMPERE, 5/10 VOLT, **CHARLES J. BOGUE ELECTRIC CO.** Motor Generator Set. Separately Excited. Complete Control Equipment. Excellent Condition.
1—1500/750 AMPERE, 6/12 VOLT, **CONNECTICUT DYNAMO & MOTOR CO.** Motor Generator Set. Full Panel-Board Arrangement. Excellent Condition.
1—1500 AMPERE, 6 VOLT, **HANSON & VAN WINKLE CO.** "INTERPOLE" CONSTRUCTION Motor Generator Set. Double Commutator Design. (Can be operated at 1500 amperes, 12 volts.) Separately Excited. Full Control Equipment.
1—1500/750 AMPERE, 6/12 VOLT, **CONNECTICUT DYNAMO & MOTOR CO.** Motor Generator Set. Excellent Condition.
1—1500/750 AMPERE, 6/12 VOLT, **HANSON & VAN WINKLE CO.** Motor Generator Set. Self-Excited. Full Control Equipment.
1—1000 AMPERE, 12 VOLT, **EAGER ELECTRIC CO.** Motor Generator Set. Single Commutator Design. Separately Excited. Full Control Equipment.
1—1000 AMPERE, 8 VOLT, **CHARLES J. BOGUE ELECTRIC CO.** Motor Generator Set. Single Commutator Design. Separately Excited. Excellent Condition.
1—750 AMPERE, 6 VOLT, **HANSON & VAN WINKLE CO.** Motor Generator Set. "INTERPOLE CONSTRUCTION." Double Commutator Design. (Can be operated at 375 amperes, 12 volts.) Full Control Equipment. Excellent Condition.
1—500 AMPERE, 24 VOLT, **HANSON & VAN WINKLE CO.** Motor Generator Set. "INTERPOLE DESIGN." For Anodizing. Excellent Condition.
2—**ABBOTT BALL COMPANY**—30" x 8" Triple-compartment Burnishing Barrels, complete with linings, gaskets, etc. Belt-driven.
1—COMPLETE ANODIZING UNIT—including **CHANDEYSSON ELECTRIC COMPANY** 1000 AMPERE, 40 VOLT, Motor Generator Set, with Synchronous Motor with controls; Tanks with temperature recorders, controllers, etc. BRAND NEW. Write for details.

M. E. BAKER COMPANY 143 SIDNEY STREET CAMBRIDGE, MASS.



CONTROL

CHROMIC or SULFURIC ACID

ANODIZING SOLUTIONS

Determine rapidly the total, free and combined acids with these simple inexpensive test sets.

OTHER SETS ALSO AVAILABLE.

Write for literature.

KOCOUR CO.

4725 S. Christiana Ave.
CHICAGO 32

Solve Your Cleaning Problems!

AHCOLOID 68 Anodic cleaning agent for steel, removes smut, grease, oil, drawing compounds in 20 seconds. Provides a chemically clean surface free from etch or stain.

AHCOLOID 70 Heavy duty cleaning material removes dirt, oil and grease by immersion. Especially effective in preparing work for painting, black oxidizing and Parkerizing.

AHCOSOLV Solvent emulsifying compounds used in power washers to remove grease, oil and chips. Formulated to leave a surface for lacquering or painting or to provide a rust retardant film for parts in process.

APOTHECARIES HALL CO.

WATERBURY, CONN.
Manufacturers of
Nickel, Copper, Brass, Cadmium,
Zinc Anodes
Cleaning and Buffing Compounds

APOTHECARIES HALL COMPANY
Established 1849
95th Year

STRIPPING COPPER?

McKEON'S

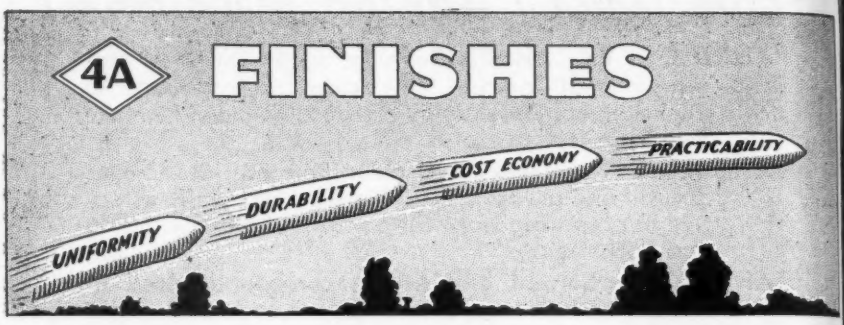
"Liquid Sulphur"
TRADE MARK REG'D

offers

FREE
SAMPLE
CONSULTATION
EQUIPMENT DESIGN
PRODUCTION ENGINEERING

HELPS YOU
SAVE CRITICAL MATERIALS
DECREASE COST
INCREASE PRODUCTION

SULPHUR PRODUCTS CO. GREENSBURG, PA.



ROCKET YOUR WAY TO THE PERFECT FINISH

COMPOUNDS:—Cutting Down, Polishing, Mirror Finishing. We have many new numbers. Our Compounds are working 24 hours a day in many large plants.

4A CEMENT:—A substitute for glue, is working the clock around setting up Wheels, Belts, Buffs and Rolls, is very economical and will save you time and money.

Samples on request.

4A HARRISON and COMPANY

Haverhill, Mass.

PEERLESS PRODUCTS

for War Production Work

Special Felt, Tampico, Wire, Cloth, Canvas, Leather, Polishing Wheels

Special Burring Methods, Compounds and Abrasives, Oil-Dri Anti-Slip-Treatment for Oily Floors. Not only absorbs oil, but is fireproof.

GEORGE A. STUTZ MFG. CO.

Plating and Polishing Equipment and Supplies

1645 CARROLL AVENUE CHICAGO, ILL.

Electroplaters —

FOR CONSISTENTLY GOOD PLATING RESULTS SPECIFY

SILVER ANODES

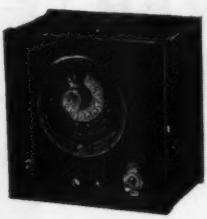
ROLLED BARS—CAST SPHERES & BARS—GRADED SHOT
PURE ELECTROLYTIC SILVER—EVENLY ANNEALED

PLATINUM ELECTRODES

PLATINUM CLAD OVER ANY LOW RESISTANCE CARRIERS

THE AMERICAN PLATINUM WORKS
N.J.R.R. AVE. at OLIVER ST.
NEWARK 5, N. J.

on the job for TIMING PRECISION



SIGNALLING TIMER

A new Timer designed to give the highest degree of precision control. The Series S Timer will command visual and audible attention the instant a time interval is completed. This Signalling Timer provides for the automatic closing or opening of a circuit at the end of elapsed time. As an indication of the versatility of the Signalling Timer, it will also operate additional buzzers, bells or lights at remote locations.

FEATURES OF SERIES S SIGNALLING TIMER

Rugged construction
Compact—
5 x 5 x 3½ inches
Dial calibration 1 second to 5 minutes
Maximum interval 1 minute to 3 hours
Motor, slow speed—self-starting
Pure silver contacts

Write for Bulletin A14

INDUSTRIAL TIMER CORPORATION

110 Edison Place — Newark, New Jersey

HEADQUARTERS

for

Buffs — Cleaners
Buffing Compositions
Nickel Anodes
Chemicals
General Supplies
Equipment

JACOB HAY CO.

(NOT INC.)

4014 West Parker Avenue
Chicago, Ill.

New Company Formed

Donham Craft, Inc. of Thomaston, Connecticut wish to announce the formation of their company dedicated to advancing the art of gold plating to an exact science. The company has installed specialized equipment for putting into mass production a new gold plating process developed during the past few years.

Control over the color and structure of deposit has been perfected to a high degree. Production speed easily approaches common base metal plating and the uniformity of the plate can meet any desired specification. The process adapts itself readily to bulk plating of small items but is easily altered to handle large complicated parts as well.

At the present this company is engaged in gold plating high priority Radar work.

RECOVER SOLVENTS

Recover Solvents and Thinners from Wash, Stripping, and Degreasing Operations by the well-known

LOFGREN PROCESS

Send quart . sample of soiled solvent to

CRANE EQUIPMENT & SUPPLY COMPANY
P. O. Box 16
Waterbury 85, Conn.

or

SOLVENTS RECOVERY SERVICE, Inc.
1019 Broad St., NEWARK, N. J.

ACID AND ALKALI PROOF LININGS AND MORTARS

•

ACID PROOF CONSTRUCTION

•

THE CEILCOTE CO.

Consulting and Research Engineers

750 ROCKEFELLER BLDG.
CLEVELAND, OHIO

BLACK-MAGIC

THE IDEAL BLACK OXIDE FINISH FOR ZINC & BRASS

A cold-process dip finish that imparts a rich, permanent black to zinc base die castings and thin sheet zinc fabrications. Corrosion and rust-proof, will not rub off. Other Black-Magic baths for brass, copper and cadmium. Also a one-bath process for all steels except stainless that bakes at 300° F. Non-priority. Ordnance approved. Samples on request.

"BLACK MAGIC" SALTS

•

"WITCH DIP" FINAL FINISH

•

SILCO VITREOUS-TYPE FINISH

MITCHELL-BRADFORD
CHEMICAL COMPANY
MODERN METAL FINISHES

2446 E. MAIN ST., Stratford P.O.
BRIDGEPORT, CONN.

TYGON TEMPRO-TEC STOP-OFF

APPLY Tygon Tempro-tec, clear or in colors, by spray, brush, or dip. Air dry 6-8 minutes. Resists all plating solutions, including hard chrome. Peels easily free after plating cycle. Will not take a plate. Can be redissolved and used again. Price $5.00 to $5.50 per gallon for the clear, depending on quantity ordered.

- Resists all plating solutions
- Strips easily free
- High dielectric strength
- Elastic

AT YOUR PLATING SUPPLY DEALER OR WRITE DIRECT

U. S. STONEWARE
Since 1865
AKRON, OHIO

FOR SALE

SLIGHTLY USED BUFFS

LOOSE & SEWED
ANY QUANTITY
ALL SIZES

~

MICHIGAN BUFF CO., Inc.
4054 BEAUFAIT AVE.
DETROIT (7) MICHIGAN

Specify

TYGON PAINT

Use Tygon Paint to protect plating room structural steel, plating equipment, tank exteriors, etc., against attack by corrosive fumes, condensates or spillage. Apply cold by brush or spray. Air dry. White, black, clear and in colors.

- Resists all plating solutions
- Non-oxidizing
- Tough and elastic
- No under film corrosion

AT YOUR PLATING SUPPLY DEALER OR WRITE DIRECT

U. S. STONEWARE

Since 1865

AKRON, OHIO

PERMAG Cleaning Compounds

Used in the Plating Room

This is the place to prove the value of a metal cleaning compound. It either stands on its merit or is thrown out.

PERMAG Compounds have stood every test for 21 years and are serving more electroplaters satisfactorily than ever before. Glad to give you details.

Magnuson Products Corp.

Mfrs. Specialized Cleaning Compounds

50 Court St., Brooklyn 2, N. Y.

Nationally Represented
Warehouses in chief cities.
In Canada: Canadian PERMAG Products Ltd.
Montreal and Toronto

Packer-Matic

AUTOMATIC

Polishing, Buffing Deburring & Brushing

MACHINES

ROTARY INDEXING
CONTINUOUS ROTARY
STRAIGHT LINE
DOUBLE ROLL
SINGLE ROLL
INSIDE & SPECIAL

Send Samples For

PRODUCTION ESTIMATES

Dept. M

THE PACKER MACHINE CO.

Meriden, Conn. U.S.A.

Now That Platinum and Rhodium Are Out For The Duration

INVESTIGATE OUR

PALLITE

PALLADIUM PLATING SOLUTION

~

PRECIMET LABORATORIES

Division of George C. Lambros

Research and Development Engineers in Precious Metals

64 Fulton Street New York 7

McGEAN CHEMICALS

ANODES SALTS

- CADMIUM
- CHROMIUM
- COPPER
- NICKEL
- ZINC
- TIN

USED BY THE LEADERS IN THE INDUSTRY

THE McGEAN CHEMICAL COMPANY

CLEVELAND, OHIO

"YANKEE BRAND"

PROGRESSIVELY BETTER ABRASIVE COMPOUNDS

Tailored to fit all finishing requirements.

Inquiries respectfully solicited

★

E. E. SEELEY COMPANY

(est. 1919)

Manufacturers

BUFFING COMPOSITIONS

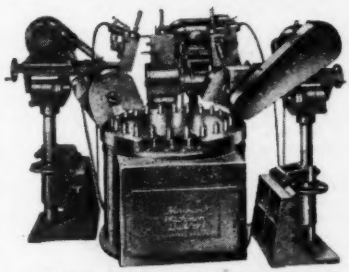
FOUNDRY FACINGS

900 Housatonic Ave., Bridgeport, Conn.

Tel. 5-0943

Hammond's

OF KALAMAZOO



ROTARY AUTOMATICS

For Deburring, Brushing, Polishing and Buffing

Write for Bulletin 401

Hammond Machinery Builders, Inc.

1664 Douglas Avenue

Kalamazoo 54, Michigan

Eastern Branch:

71 West 23rd St., New York 10, N. Y.

Don't Be Confused

by big promises. After all's said and done, quality is remembered long after price is forgotten, and promises mean nothing unless backed up by performance.

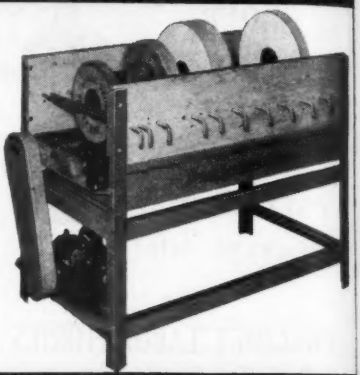
We are proud of our reputation for quality and service and we are confident of our ability to serve you faithfully and well.

THE ROBERTS ROUGE COMPANY

Stratford, Connecticut

Specialists in Manufacturing of Thoroughly Dependable Gold, Sterling and Silver Plate Rouges; Stainless Steel, Chrome and Crocus Compounds

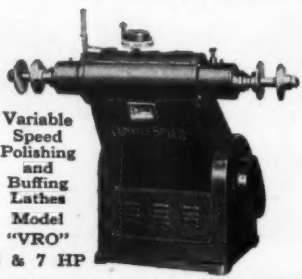
Spread Manpower and Materials Further with Polishing Wheel Washers



Write for the complete story of their Savings for You

Divine Brothers Company
INCORPORATED
Utica 1, New York, U.S.A.

Hammond
OF KALAMAZOO



Variable Speed Polishing and Buffing Lathes
Model "VRO"
5 & 7 HP

POLISHING & BUFFING MACHINERY

Write for Catalog 52

Hammond Machinery Builders, Inc.
1664 Douglas Avenue
Kalamazoo 54, Michigan
Eastern Branch:
71 West 23rd St., New York 10, N. Y.

This **"SAWTOOTH"** *Anode*
GIVES 50% MORE SURFACE!

The many-angled surface of the Heil "Sawtooth" anode means greater electrical efficiency and throwing power. Angular construction lends rigidity. Made of extruded lead, with hooks coated and integrally bonded. Five standard hook styles available. *"Sawtooth" anodes sell in same price range as standard flat anodes.*

Also a complete line of other standard and special anodes.

• *Write for full information* •

HEIL ENGINEERING CO.
12906 Elmwood Ave. Cleveland 11, O.

PATENTS

These patents are abstracted from the Official Gazette of the Patent Office. Copies of these patents may be secured by sending ten cents for each copy desired to the Superintendent of Documents, Washington, D. C. giving the date, number, name of inventor of the patent.

August 15, 1944

#2,355,933—Process of Metal Plating by Max Weiss assigned to Cohan-Epner Co., Inc. Plating of plastic articles by first rolling in sand, rinsing then dipping, first in a ferrous sulfate solution and then into a copper sulfate solution and then dipping in a solution of water, ethyl alcohol, sulfuric acid, quinol and stannous sulfate, rinsing in water and then dipping in a solution of sodium hydroxide, silver nitrate with ammonia and a reducing agent.

August 22, 1944

#2,356,183—Purification of Nickel salts by Hugh Shepard and Carl Knierim assigned to American Smelting and Refining Co. Removal of iron from nickel salt solutions.

#2,356,329—Method for the separation and reclamation of copper from printing plates and the like by Axel Lundbye assigned to Crowell-Collier Publishing Co. Method consists of electrolytic stripping of nickel on surface protecting exposed copper surface with whiting and melting out lead backing followed by heating and chilling to form easily removable scale of balance of lead base.

#2,356,543—Process for the electrolytic production of opaque layers similar to enamel on aluminum and its alloys by Carlo Sounino and Antonio Sassetti vested in the Alien Property Custodian. Anodic treatment in a solution of chromic acid, zinc chromate and magnesium chromate.

#2,356,543—Process for the cathodic treatment of metals by Jean Frasch vested in the Alien Property Custodian. A protective coat on a metal of a group consisting of iron, aluminum and copper consisting of treatment in a solution of chromic acid and potassium permanganate, the metal to be treated connected by an external conductor to a magnesium electrode which is in the same solution and not touching the parts being treated.

#2,356,583—Process of preparing soldering coppers by Leon Hampton assigned to Bell Telephone Laboratories. A soldering copper on a portion of which iron is electrodeposited and this portion heated in aluminum powder to form a coating the aluminum coating being removed from a portion of the iron to form the working surface.

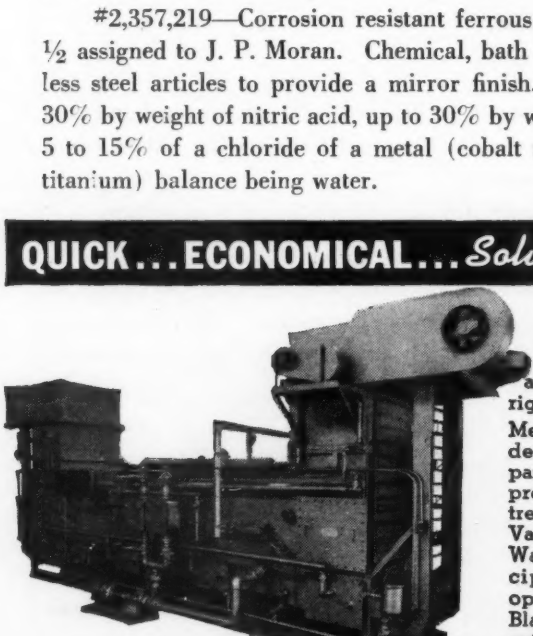
August 29, 1944

#2,356,747—Cleaning composition and process by Max I. Powman and Howard Packer. The process of cleaning surfaces of carbon and dirt by applying a composition consisting of neutral coal tar oil 40%, monoethanolamine 15%, oleic acid 15%, ethylene glycol 15%, orthotoludine 15%, ethyl silicate .5% and phosphoric acid .5% and then removing the reaction product.

#2,356,897—Process for electrodeposition of metal by James R. Stack assigned to Nassau Smelting & Refining Co. Electrodeposition of copper, lead or tin from a solution of an aromatic sulfonic acid and appropriate metal salt using an insoluble anode of lead and antimony.

#2,357,219—Corrosion resistant ferrous alloys. Norman S. Mott. ½ assigned to J. P. Moran. Chemical, bath for the treatment of stainless steel articles to provide a mirror finish. Solution contains 10 to 30% by weight of nitric acid, up to 30% by weight of hydrofluoric acid, 5 to 15% of a chloride of a metal (cobalt nickel, iron, chromium or titanium) balance being water.

QUICK...ECONOMICAL...*Solvent* DEGREASING



The time is here when a thorough degreasing job must be done fast and *at low cost!* That's a Blakeslee job. It is being done right now in hundreds of plants. Metal components of all kinds—from deep drawn stampings to threaded parts—are completely cleaned and prepared for finish, assembly heat-treating, etc. Blakeslee Solvent Vapor Degreasers and Metal Parts Washers operate on simple principles which assure minimum operating expense. Let us send a Blakeslee representative to see your set-up and make our recommendations. Write for 24 page bulletin.

G. S. BLAKESLEE & CO.

Main Office and Plant: Cicero Station, Chicago 50, Illinois

New York Toronto, Ontario

BRANCH DIRECTORY

ANDERSON meets second Tuesday of every month at 7:30 p.m., at the Y. M. C. A., Anderson, Indiana. Secretary-Treasurer, E. L. McKinney, 2014 Fairview St., Anderson, Ind.

BALTIMORE-WASHINGTON meets at the Telford Buffeteria, 14th and Decatur Sts., N.W. Washington, D. C. the first Saturday of each month. Secretary-Treasurer, Raymond Stricklen, 3413 Caton Ave., Baltimore, Md.

BOSTON meets at the Hotel Statler, Boston, Mass., first Thursday each month. Secretary, A. W. Garrett, 35 Rosemont St., Dorchester, Mass.

BRIDGEPORT meets first Friday of each month at Chamber of Commerce Rooms, Stratfield Hotel. Secretary-Treasurer, Joseph G. Sterling, 134 Colony St., Bridgeport 8, Conn.

BUFFALO meets second Friday of each month at Hotel Statler, Buffalo, N. Y. Secretary J. C. Mays, 8436 W. Rivershore Dr., Niagara Falls, N. Y.

CHICAGO meets second Friday of each month at 8 p.m., Atlantic Hotel, 316 S. Clark St. Secretary, M. H. Longfield, 1528 South 61 St., Cicero 50, Ill.

CINCINNATI meets on fourth Thursday of each month at 8 p.m., at the Engineering Society Headquarters, McMillan St. and Woodburn Avenue, Cincinnati, Ohio. Secretary-Treasurer, Elliott W. Horning, 2425 Kenilworth Ave., Norwood 12, Ohio.

CLEVELAND meets first Saturday of each month at Cleveland Hotel. Secretary-Treasurer, Harvey P. Hell, 12901 Elmwood Ave., Cleveland 11, Ohio.

DAYTON meets second Friday of each month at the Engineers Club, Dayton, Ohio. Secretary-Treasurer, W. M. Durnbaugh, R. R. 4 Xenia, Ohio.

DETROIT meets the first Friday of each month at the Hotel Statler. Secretary-Treasurer, F. L. Clifton, 16536 Inverness, Detroit 21, Mich.

GRAND RAPIDS meets second Friday of each month, 7:30 p.m., at the Rowe Hotel. Secretary-Treasurer, James B. Haviland, 648 Rosewood S.E., Grand Rapids 6, Michigan.

HARTFORD meets third Monday of each month alternately at Hartford Electric Light Company, Hartford and at the Elks Club, corner South and Main Sts., Bristol, Conn. Special meetings are held at the New Britain Trade School, New Britain, Conn. Secretary, F. W. Smith, 46 Cottage St., Meriden, Conn.

INDIANAPOLIS meets at the Hotel Riley, the first Wednesday of each month. Secretary-Treasurer, Carl R. Morris, 1828 N. Pennsylvania, Indianapolis, Ind.

JACKSON-LANSING meets second Tuesday of each month alternating between Home Dairy at Lansing and Hotel Hayes at Jackson. Secretary-Treasurer, C. E. Topping, 1104 S. West Ave., Jackson, Mich.

LANCASTER meets second Friday of each month at 8 p.m., at Thaddeus Stevens Industrial School, Lancaster, Pa. Secretary-Treasurer, W. H. Fordney, 603 Marietta Ave., Lancaster, Pa.

LOS ANGELES meets the second Monday of each month, 6:30 p.m. at the Rossiyn Hotel, corner Fifth and Main Sts. Secretary-Treasurer, Frank Bunker, 2030 Bay St., Los Angeles, Calif.

MILWAUKEE meets first Friday of each month at Republican Hotel. Secretary-Treasurer, James Durnford, 2370 N. 32nd St., Milwaukee 10, Wis.

MONTREAL meets first Monday of each month at Mount Royal Hotel, Montreal, Quebec, Canada. Secretary-Treasurer, W. G. Finlay, 5670 16th Ave., Rosemount, Montreal.

NEWARK meets first and third Friday of each month at Hotel Robert Treat, Newark, N. J., at 8 p.m. Secretary-Treasurer, George Wagner, 1130 So. Long Ave., Hillside, N. J.

NEW HAVEN meets the first Tuesday of each month at Sterling Chemistry Laboratory, Yale University. Secretary-Treasurer, B. J. Gaffney, 40 Filbert St., Spring Glen, Hamden 14, Conn.

NEW YORK meets second and fourth Fridays of each month, in the Hotel Pennsylvania, 7th Ave. and 33rd St., New York City, N. Y. Secretary-Treasurer, Franklyn MacStoker, 25 Princeton St., Garden City, L. I., N. Y.

PHILADELPHIA meets fourth Friday of each month, in the Harrison Laboratory Building, University of Pennsylvania, 34th and Spruce Sts. Secretary, Paul Mentzer, Sr., 7242 Bingham St., Philadelphia 11, Pa.

PITTSBURGH meets first Thursday of each month, at 6:30 p.m. at the Roosevelt Hotel, Pittsburgh, Pa. Secretary-Treasurer, Frank Keller, 1102 Hiland Ave., Coraopolis, Pa.

PROVIDENCE-ATTLEBORO meets the third Monday of each month at the Providence-Baltimore Hotel. Secretary-Treasurer, Chas. C. Chace, 11 Friendly Road, Cranston 10, Rhode Island.

ROCHESTER meets second Friday of each month at the Hotel Seneca, Rochester, N. Y. Secretary-Treasurer, Donald C. Blum, 672 Mt. Read Blvd., Rochester, N. Y.

SAN FRANCISCO meets the last Thursday of each month, usually at Angelo's, 4307 San Pablo Avenue, Oakland, Calif. Secretary-Treasurer, Arthur Kistler, 15th and Vermont Sts., San Francisco, Calif.

SPRINGFIELD meets the fourth Monday of each month at the Hotel Charles. Secretary-Treasurer, Paul Lyman, Westinghouse Electric & Mfg. Co., Springfield, Mass.

ST. LOUIS meets first Friday of each month at Central Y. M. C. A., 16th and Locust Sts. Secretary-Treasurer, C. T. McGinley, 8319 Garfield, St Louis, County 14, Mo.

SYRACUSE meets second Friday of each month at Bowne Hall, Syracuse University, Syracuse, N. Y. Secretary, Neil Maffei, 206 Union Ave., Syracuse 3, N. Y.

TOLEDO meets first Thursday of each month, in Room 201, of the Hilcrest Hotel, Toledo, Ohio. Secretary, Gaston Bergeman, 718 Howland St., Fremont, Ohio.

TORONTO meets second Friday of each month at Royal York Hotel, Secretary-Treasurer, E. B. Creighton, 468 Deloraine Ave., Toronto, Ont., Canada.

WATERBURY meets second Friday of the month at Elton Hotel. Secretary-Treasurer, Spencer L. Henn, Apothecaries Hall Co., Waterbury 88, Conn.

A. E. S. OFFICERS

President: M. R. CALDWELL . . . . W. B. Jarvis Co., 1501 Paris Ave. S.E., Grand Rapids 2, Mich.
First Vice-President: W. L. PINNER, Houdaille-Hershey Corp., Detroit 11, Michigan
Second Vice-President: F. SAVAGE . . . . . C. G. Conn Co., Ltd., Elkhart, Ind.
Third Vice-President: R. J. O'CONNOR . . . . 55 Anson Street, Stratford, Conn.
Past President: G. J. WAGNER . . . . . 1130 S. Long Avenue, Hillside, N. J.
Executive Secretary: E. T. CANDEE . . . . . Box 791, Waterbury 88, Conn.

THE ABSTRACT SECTION

WALTER PINNER

Chairman Program and Educational Committee

"A Study of the Possibility of Precipitation of Antimony as Oxychloride in Copper-Refining Electrolyte." By YU-LIN YAO. Electrochemical Society—Preprint 86-1, for meeting of Oct. 12-14, 1944, p. 1-6.

Chloride is an essential constituent of copper-refining electrolyte. It is well known that chlorides minimize the tendency for codeposition of antimony with copper. For many years precipitation of antimony as oxychloride has been offered as an explanation of this effect. In this paper evidences are given to show that this explanation is incompatible with facts.

FRANK K. SAVAGE, VINCENT MATTACOTTI

"Historic Development of Caustic-Chlorine Cells in America." By L. D. VORCE. Electrochemical Society—Preprint 86-3, for meeting of Oct. 12-14, 1944, p. 29-38.

The development of the American electrolytic alkali-chlorine industry covers a period of over 100 years. Numerous difficulties, both chemical and commercial, had to be overcome. Today the industry ranks among the very foremost of the entire electrochemical group. As to the future, there are still problems of cell construction and cell operation that await solution.

FRANK K. SAVAGE, VINCENT MATTACOTTI

"Current Efficiency Studies of the Hooker Type S Chlorine Cell." By R. L. MURRAY and M. S. KIRCHER. Electrochemical Society—Preprint 86-2, for meeting of Oct. 12-14, 1944, p. 7-27.

A study was made to determine the relative magnitude of the various processes causing loss of current efficiency in Hooker Type S chlorine cells. Loss of NaOH production from theoretical is due almost entirely to migration of OH^- ions through the diaphragm from the catholyte to the anolyte. The alkali, NaOH, from the catholyte tends to decrease the hydrogen ion concentration of the anolyte, whereas several processes at the anode and in the anolyte tend to increase it. Consequently, a certain pH is established which, it is shown, depends principally upon the current efficiency, the NaCl concentration and the type and condition of the anode. The determination of anolyte pH is shown to be a convenient approximate test for the determination of current efficiency for control purposes.

The relationship between current efficiency loss and various reactions occurring in the cell were investigated and quantitative relationships between ion concentrations and current efficiency loss were developed. Methods of testing for experimental work and for control were worked out.

VINCENT MATTACOTTI, FRANK SAVAGE

Modern Electrotinning. By E. ARMSTRONG. *Metal Treatment* **7**, 154-61, 67 (1942).

The $SnCl_2$ bath is used in America for tin plating small articles for elec. equipment in inclined rotary barrels at 150-160° F. $SnSO_4$ baths possess merits in particular for barrel plating at ordinary shop temperature. They are also used for still tank (and strip steel) plating, but ordinarily not so advantageously as the alkaline stannate solns. For Sn plating to specified thicknesses the modern electrolyte has an alkaline sodium stannate base and operates hot with Sn anodes. The tendency for the deposits to be crystalline and nonadherent at the edges is com-

pletely overcome by using Ni anodes. Complete description of the plating solution and conditions and of the requirements of various base metals and service conditions are given.

By F. G. NORRIS

The Question of Chemical Polarization Accompanying the Separation and Solution of Metals in Aqueous Electrolytes. By G. MASING. *Z. Elektrochem.* **48,** 85-6 (1942); *Chem. Abstracts* **37,** 40 (1943).

The cathode polarization in cyanide copper plating baths is not due to slow dissociation of the copper cyanide complex, as was suggested by LeBlanc and Schick, but must depend only on the slowness of discharge of the copper ions themselves. These considerations are applied to data on the polarization of nickel in nickel chloride solutions.

By ERNEST H. LYONS, JR.

Electrogalvanizing. By RICHARD SPRINGER. *Metallwaren-Ind. Galvano-Tech.* **39,** 7-12, 29-36 (1941); Chem. Zentr. 1941, 1, 1733.

A review of the various zinc-plating baths, methods of testing deposits and their subsequent treatment.

M. G. MOORE,
Chemical Abstracts

Electrodeposition of Antimony. By R. PIONTELLI and G. TREMOLADA. *Met. ital.* **32,** 417-32 (1940); *Physik. Ber.* **22,** 1560 (1941); *Chem. Abstracts* **37,** 1336 (1943).

Smooth, adherent antimony deposits, which could be polished, were obtained from a bath containing 50 g./l. Sb and 150 g./l. free tartaric acid. The anodes became passive at a c.d. of 9 amp./sq. ft.; this could be prevented by adding sulfuric acid, but the cathode deposit was adversely affected. For antimony refining a suitable solution is Sb 60, free H_2SO_4 300, and HF 20 g./l. Details of refining processes are given.

ERNEST H. LYONS, JR.

Effect of Impurities in the Copper on the Electrical Properties of Cuprous Oxide Rectifiers. By P. V. SHARASKII. *J. Tech. Phys.* (U.S.S.R.) **12,** 149-68 (1942); *Chem. Abstracts,* 1337 (1943).

Higher concentrations of Al, Be, Si, Ni, As, Sn, and Sb in copper prevent adherence of the oxide film, and therefore rectifiers cannot be prepared. In smaller amounts, Be, Al, Si, P, Fe, Zn, Ag, An, and Sn reduce the efficacy of the rectifier; while Co, Ni, As, Cd, Sb, Pb, and Bi increase the rectifier resistance. 0.1% Pb and 0.1% Sb improve the rectification, and may compensate for the bad effect of Zn.

ERNEST H. LYONS, JR.

Relation between alteration in Protective Coatings on Steel and Variations in Electromotive Force. By ANTONY VILA and RAOUL DESALME. *Compt. rend.* **214,** 483-5 (1942).

Samples of steel with various protective coatings were subjected to the following daily cycle of artificial aging: freezing at —6° C.; alternate periods of wet and dry heat at 75° C., and chilling to 15° C., for 6 hrs.; exposure to an atm. of 2% SO_2 for 3 hrs., and immersion for 14 hrs. in artificial sea water. After each cycle, the e.m.f. of the sample was measured against a Pt electrode in freshly distilled H_2O. The most protective coatings were regarded as those which retard most the rise of the e.m.f. to 0.8, the value for unprotected steel. To attain a potential of 0.68, oiled steel took 1 cycle; steel coated with a minimum of zinc took 15 cycles. This method enables the progress of corrosion to be followed and described objectively before it becomes visible under a lens; this saves time.

CYRUS FELDMAN,
Chem. Abstracts

BOOK DEPARTMENT

BOOK REVIEWS

By

DR. GEORGE DUBPERNELL, *United Chromium, Inc.*

Journal of the Electrodepositors' Technical Society, Volume 18, 1942-1943. 153 pages. Published by the Society, c/o Northampton Polytechnic Institute, St. John Street, Clerkenwell, London, E. C. 1, England, June 1944. Price one guinea (21 shillings or about $4.40).

With this volume the British society is back on an annual schedule of publication, and are to be congratulated on their increased activity under wartime conditions. The volume is received automatically by members of the society in addition to bulletins and reprints of the papers from time to time, but there seems to be continual difficulty with Customs regulations in importing copies of the bound volume for non-members. It is therefore suggested that anyone who desires to obtain the publications of this society should become a member, as the cost is the same as the price of the bound volume except for an entrance fee of half this amount, and it is the only way to obtain the material dependably.

The papers in Volume 18 are up to the usual high standards of the Electrodepositors' Technical Society, which is associated with the Faraday Society. The first is by S. Wernick on "The Trend of Electroplating Development" (pages 1-12). The state of the industry in 1939, war finishes, metal finishing today, post-war developments, specifications, heavy deposits, factory versus job shop metal finishing, improvement inside the shop, technical direction, education, and competitive industries, are some of the subjects considered.

"The Brytal Process for the Anodic Oxidation of Aluminum" is described on pages 13 to 20 by A. Ensor. H. Silman discusses "Electrodeposited Rust-Proofing Coatings" on pages 21 to 32. This includes a review of different types of electrodeposits, cleaning and pickling, cold rolled steel, nickel, tin, zinc and cadmium, relative corrosion resistance, zinc-cadmium alloy deposits, corronising, lead, and the testing and thickness of coatings.

The next paper on pages 33-42 is by A. W. Wallbank on "Anodising in War Time." It relates to the treatment of aluminum for various purposes, as for protection, for color, for photography, for abrasion resistance, for reflection, for inspection and for insulation. The same author gives a general review of common methods for determining the thickness of electrodeposits on pages 43-47 as an introduction to a paper on pages 48-54 by L. S. Larkin on "The Determination of the Thickness of Deposits by Specific Gravity." The latter author finds thickness determination possible by his non-destructive method if the specific gravities of the basis metal and of the deposit vary by more than 0.5 and if the density of the basis metal is known to within 0.002. Examples are given of 0.0005″ of cadmium on steel and on lead; 0.002″ of copper on

steel and on aluminum. The thickness found is generally slightly higher than that found by other methods.

The Annual Report of the Society covers pages 55-64, and is followed on pages 65 to 67 by a discussion of the paper by W. F. Jesson in Volume 17 on "Solvent Economy in Trichlorethylene Degreasing Plants." Then there is a paper on pages 69-76 by E. H. Laister on "War-Time Applications of Precious Metal Plating." Next is a general discussion on "Hard Chromium Plating" on pages 77-87 which is introduced by a five-page paper by C. Wharrad on the "Chromium Plating of Tools." This is followed by another general discussion on the subject of "Electric Power in Plating Plants" on pages 89-102 which is introduced by a six-page paper by J. Kronsbein.

A good review of the "Electrolytic Polishing of Metals" including some tests of published procedures is given on pages 103-126 by S. Wernick. "Zinc Plating from Sodium Zincate Solutions" including methods of analysis of the solutions is discussed on pages 127-137 by N. A. Tope. D. D. Howat gives "Some Applications of Chromium Plating in Ordnance Manufacture" on pages 139-149. These include the salvage of gun parts, plug and ring gages, lathe centers, punches and dies, prevention of scaling during heat treatment, and particularly the plating of profile milling copy plates.

(1) Cleaning and Finishing Metal Products. Published by The Iron Age, New York. 235 pages. $3.00.

(2) An Introduction to Electrochemistry. By Samuel Glasstone. 553 pages. $5.00.

(3) Modern Metallurgy for Engineers. By Frank T. Sisco. 432 pages. $4.50.

(4) Standard Handbook for Electrical Engineers. Edited by A. E. Knowlton and R. M. Shook. 2303 pages. $8.00.

(5) Principles and Applications of Electrochemistry, Volume I, Principles. H. Jerman Creighton. Fourth edition. 477 pages. $5.00.

(6) Electroplating and Anodizing. By J. Rosslyn. 224 pages. $2.50.

(7) Hardness and Hardness Measurements, Samuel R. Williams. 558 pages. 1942. Price $7.50.

A. E. S. BOOK DEPARTMENT

I enclose $_____ in payment for the following books, to be sent to me postage prepaid: (This offer good only in U. S. A.)

NAME _____

STREET _____

CITY _____ STATE _____

Please quote me prices on the following books not listed on this page:

MEMBERSHIP REPORT

FRANK K. SAVAGE

Chairman, Membership Committee

To October 1944

ELECTIONS

Chicago Branch

PAUL GLAB, 882 N. Paulina St., Chicago, Ill., Active
HOWARD CONNOR, 1627 N. 76 St., Chicago 35, Ill., Associate

Dayton Branch

H. J. HUESTER, Lt. Comdr. U. S. N. R. Office of Bureau of Aeronautics, Wright Field, Dayton, Ohio

Indianapolis Branch

CECIL O. BROWN, McClellan Casket Hardware Co., Richmond, Ind., Active
WALTER M. JENKINS, 1146 Congress Ave., Indianapolis, Ind., Associate
HARRY R. LISTER, 1715 Maple St., Columbus, Ind., Active
CARL F. NIEHAUS, 937 N. Capitol Ave., Indianapolis, Ind., Associate
ROBERT C. MATLOCK, 2511 Frederica St., Owensboro, Ky., Active
ARTHUR L. SCHMIDT, 423 N. Walnut St., Union City, Ind., Associate
JOHN STEVEN SMITH, 325 Pearl St., Richmond, Ind., Active
JAMES E. STALLINGS, 538 Stadium Dr., Fort Wayne, Ind., Associate

Lancaster Branch

JOHN C. MYLIN III, Mountville P. O., Lancaster Co., Pa., Active
WILLIAM BANNAN, 811 North Ann St., Lancaster, Pa., Active
ROBERT OWEN, 844 Highland Ave., Lancaster, Pa., Associate
JOSEPH B. KISTLER, Lafayette Ave., R. D. 4, Lancaster, Pa., Associate

Los Angeles Branch

JOE MIXON CLARK, 6456 Buman Ave., North Hollywood, Calif., Active
EDGAR PAUL TROEGER, 2816 D Montana Ave., Santa Monica, Calif., Associate
HOMER SMITH YOUNG, 11324 Farlin St., Los Angeles 24, Calif., Associate

Providence-Attleboro Branch

EVERETT FERNALD, 1 Greystone Ave., Greystone, R. I., Active
WILFRED AUCLAIR, 65 Roger William Ave., Rumford, R. I., Active
RICHARD ROSA, 232 Federal St., Providence, R. I., Active
MELVIN POST, Pleasant St., R.F.D. 3, Attleboro, Mass., Active
JAMES T. KELLY, 73 Clifton St., Attleboro, Mass., Active

Syracuse Branch

LOUIS LOWENSTEIN, 81 Gaylord St., Binghampton, N. Y., Associate
ALBERT B. LLOYD, 548 Claunden St., Syracuse 10, N. Y., Associate
ARTHUR G. MARTINEAU, Elmwood Plating Works, 1024 Anondaga Ave., Syracuse, N. Y., Active
CLINTON S. BEERHAUS, 20 E. Lake St., Shaneatetes, N. Y., Associate
JOHN F. ROTH, 2629 James St., Syracuse, N. Y., Associate

Toronto Branch

JOHN McROBERTS, 210 Milverton Blvd., Toronto, Ont., Active

Waterbury Branch

MARCOS BRASLAVSKY, Apartado 9434, Mexico, D. F., Associate
MICHAEL GENOVISE, c/o Waterbury Plating Co., 112 Porter St., Waterbury, Conn.

APPLICATIONS

Bridgeport Branch

ALEXANDER HERSHEY, 386 Iranistan Ave., Bridgeport 4, Conn., Active
ROBERT G. PARKER, 975 Lindley St., Bridgeport, Conn., Associate
HUGH MORRIS, 105 King St., Bridgeport 5, Conn., Associate
THOMAS BARNES, 230 Stratford Ave., Bridgeport, Conn., Associate

Chicago Branch

C. T. DOSTALE, 1929 S. 21 Ave., Maywood, Ill., Active
S. WRAY, JR., 30 W. Chicago Ave., Chicago, Ill., Active
L. A. HUMPHREY, 417 W. 6th St., Belvidere, Ill., Active
R. E. TOWNER, 4352 Wrightwood Ave., Chicago 39, Ill., Associate

Dayton Branch

CHARLES A. MITCHELL, c/o The Mitchell Engineering Co., Springfield, Ohio, Associate

Hartford Branch

JAMES O'SHEA, 108 Main St., Southington, Conn., Associate
HENRY HORNBERGER, 44 S. Park St., Willimantic, Conn., Active
ISADORE WOLFSON, P. O. Box 308, Portland, Conn., Associate
JOSEPH SCHIFFER, Wm. Prym, Inc., Dayville, Conn., Active
CHARLES TWIST, P. O. Box 427, Norwich, Conn., Active
FRANK TARZA, 63 Thomas Drive, Manchester, Conn., Associate

Jackson-Lansing Branch

FRED ASTON, 8237 G. M. Bldg., Detroit, Mich., Associate
ROBERT QUICK, 1800 Cooper St., Jackson, Mich., Associate
VICTOR STEPHENS, Carrier Stephens Co., Lansing, Mich., Associate
ELTON V. PIPER, 2912 Gardinia Ave., R. 5, Lansing, Mich., Associate
DELBERT J. PALMER, 1415 Roosevelt Ave., Lansing, Mich., Associate
BERT FAGER, 400 Norwood, Sturges, Mich., Associate
JACK GARBRY, 1110 Linwood, Jackson, Mich., Associate

GEORGE BAUER, 306 Orchard St., E. Lansing, Mich., Associate
WAYNE SCOTT, 140 S. State St., Alma, Mich., Associate
LAWRENCE H. JAMES, Reo Motors, Inc., Lansing, Mich., Active
ALVIN S. POTTER, 320 Jones St., Lansing, Mich., Active

Pittsburgh Branch

B. A. MORELAND, Feeder Div., Westinghouse Elec. & Mfg. Co., East Pittsburgh, Pa., Active

MYRON CERESA, 118 Idlewood Road, Box 641, R. D. 2, Turtle Creek, Pa., Active

Providence-Attleboro Branch

CALVIN HINDS, 21 Jewel St., Attleboro, Mass., Active

JAMES SHOCKROD, 41A Holman St., Attleboro, Mass., Active

LOUIS E. TAUS, 297 Dyer St., Providence, R. I., Active

JOHN BROADBENT, Reliable Electroplating Co., Attleboro, Mass., Active

CHANGE OF STATUS

Syracuse Branch

IRVING A. PSYCH from Associate to Active Membership
T. F. DIVALL from Associate to Active Membership

TRANSFERS

VERNON JULIANNE from Philadelphia Branch to New York Branch
L. A. REISMAN from Pittsburgh Branch to Philadelphia Branch
BRADFORD CLARK from Lancaster Branch to Baltimore-Washington Branch

RESIGNATIONS

Anderson Branch
C. D. CLEAVER

Chicago Branch
E. VAN GOETHEM
R. S. ARTHUR

Indianapolis Branch
HAROLD P. CHASE

Milwaukee Branch
FRED HAU

SUSPENSIONS

Anderson Branch
E. T. RANSON

Boston Branch
LESTER F. POPE

Indianapolis Branch
HENRY A. MIELKE
OVEL WITHERS

Pittsburgh Branch
ROBERT D. WISE

DEATHS

Hartford Branch

A. J. MAYNARD, 944 Asylum St., Hartford, Conn., Active

MEMBERSHIP CHART

BRANCH	May 1944	Change in Membership	Percent Change
SYRACUSE	51	+13½	+26.4
INDIANAPOLIS	74	+14	+18.9
PROV.-ATTLEBORO	66	+ 8	+12.1
LOS ANGELES	123	+13	+10.5
DAYTON	100	+ 7	+ 7.
TORONTO	109	+ 7	+ 6.4
NEW HAVEN	95	+ 6	+ 6.3
WATERBURY	111	+ 7	+ 6.3
CLEVELAND	115	+ 6	+ 5.2
PHILADELPHIA	138	+ 7	+ 5.
CHICAGO	323	+16	+ 4.9
LANCASTER	40	+ 1½	+ 3.7
NEWARK	198	+ 7	+ 3.5
DETROIT	336	+11½	+ 3.4
CINCINNATI	63	+ 2	+ 3.1
NEW YORK	158	+11½	+ 3.1
BOSTON	130	+ 4	+ 3.
BRIDGEPORT	102	+ 2	+ 1.9
GRAND RAPIDS	109	+ 2	+ 1.8
BUFFALO	80	+ 2	+ 1.2
ROCHESTER	83	+ 1	+ 1.2
BALTIMORE-WASH.	107	+ 1	+ .93
ST. LOUIS	111	—	—
MILWAUKEE	97	—	—
SPRINGFIELD	79	—	—
JACKSON-LANSING	51	—	—
TOLEDO	42	—	—
SAN FRANCISCO	39	—	—
HARTFORD	114	— 1	— .87
PITTSBURGH	68	— 1½	— 2.2
MONTREAL	50	— 2	— 4.
ANDERSON	23	— 2	— 8.6

MEMBERSHIP MAY 1, 1944	=	3385
MEMBERSHIP OCT. 1, 1944	=	3522
Gain in Membership	=	137
Per Cent of Gain 4%		

Udylite Metal Finishing Supplies are th
finest available—dependable, efficien
carefully tested and approved in our ow
laboratories under actual plant conditio
before they are offered to you.

When you buy Udylite supplies you bu
a share in one of the finest staffs of engi
neers and electrochemists in the country
These men know metal finishing fro
A to Z and their combined "know-how"
is at your service to solve any finishin
problems you may have. They'll not onl
put you right but they'll keep you th
way by constant check and control if yo
wish. *There* is something money cannot buy
It's Udylite's plus value at no extra co

VISIT THE UDYLITE EXHIBIT
D628-D632—NATIONAL METAL
EXPOSITION—CLEVELAND

THE UDYLITE CORPORATIO

1651 E. Grand Blvd., Detroit 11, Mich.

Chicago 12
1943 Walnut Street

Long Island City 1, N. Y.
11-16 44th Drive

Cleveland 3
4408 Carnegie Ave.

INDEX TO ADVERTISERS

Alsop Engineering Company ... 933
American Brass Company 891
American Buff Company 906
American Chemical Paint Co. 935
American Platinum Works 953
Apothecaries Hall Company .. 951

Bacon Felt Company 913
Baker Company, M. E. 950
Blakeslee & Co., G. S. 960
Buckingham Products Co. 885

Ceilcote Company, The 954
Chemical Corporation 905
Codman Company, F.L. & J.C. 908
Cowles Detergent Co., The 904
Crane Equipment & Supply Company 954

Darco Corporation 923
Detrex Corporation 916
Divine Brothers Co. 958
Du Pont de Nemours Co., Inc., E. I. 921
Duralac Chemical Corp. 922

Egyptian Lacquer Mfg. Co., The 893
Enthone Company, The 888

General Chemical Co. 942
Green Electric Co., Inc. 896
Gumm Chemical Company, Fred k. ..... Second Cover

Hammond Machinery Builders, Inc. 957-958
Hanson-Van Winkle-Munning Company 924-925
Harrison Company 952
Harshaw Chemical Co., The .. 934
Hay Company, Jacob 954
Heatbath Corp. 940
Heil Engineering Corp. 958

Industrial Filter & Pump Co. 917
Industrial Timer Corp. 953
Industrial Washing Machine Company 890

Kocour Company 950

Lasalco, Inc. 907
Lea Manufacturing Co. Back Cover
L'Hommedieu & Son Co. 914

Maas & Waldstein Co. 895
MacDermid, Inc. Third Cover 972
Magnus Chemical Co. 897
Magnuson Products Corp. 956
Manderscheid Co., The 894
McGean Chemical Co. 957
Meaker Company, The 918
Michigan Buff Co., Inc. 955
Michigan Chrome & Chemical Company 915
Mitchell-Bradford Chemical Company 955

Oakite Products, Inc. 877

Packer Machine Co., The 956
Precimet Laboratories 957
Puritan Mfg. Co., The 936

Quinn, Nelson J. 889

Rheem Research Products, Inc. 892
Roberts Rouge 958

Seeley Company, E. E. 957
Sparkler Mfg. Co. 879
Stevens, Frederic B. 880
Storts Welding Co. 943
Stutz Mfg. Co., George A. 952
Sulphur Products Co., Inc. 951

Udylite Corporation, The 970
United Chromium, Inc. 887-941
U. S. Stoneware 955-956

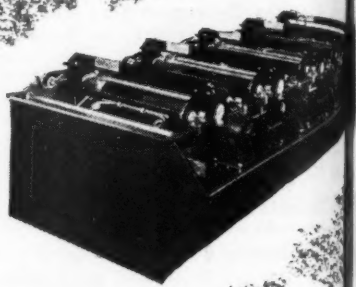
Westvaco Chlorine Products Co. 899
Wyandotte Chemicals Corp. 878

Zapon Div., Atlas Powder Co. 882

Equipment

FOR NEW ENGLAND MANUFACTURERS

Your MAC DERMID INCORPORATED Technical Service Engineer, operating from Waterbury, will be pleased to help you with your every metal finishing problem. Ask him to show you folders on the newer types of equipment now available for improved cleaning, plating, and finishing operations. Place your orders NOW for all equipment needs.



MULTIPLE PLATING BARREL UNIT—Strong, effic durable. Large capacity. High current carryin

HORIZONTAL BARREL with Manually Operated Hoist.

HANDIPLATER—Sturdy, compound, inexpens Ideal for plating odd lots of small parts w any plating solution.

Complete Suppliers to the Metal Finishing Industry

For Conditioning Steel Before
Painting or Other Organic Finishing

OAKITE
CRYSCOAT
PROCESS

Out of the war has come this revolutionary LOW-COST process made possible by Oakite CrysCoat No. 86, designed for treating surfaces of steel and iron parts so that when paint is applied, it grips surfaces, adheres tenaciously.

Performing THREE distinct functions in ONE time-saving operation, Oakite CrysCoat No. 86 helps you step-up production, reduce rejects, secure improved results because it:

1. *Effectively, safely removes oil, grease, dirt from steel and iron parts.*
2. *Imparts to surfaces a microscopic coating that assures improved grippage . . . more tenacious adhesion of paint, lacquer, varnish.*
3. *Inhibits surfaces against rusting before application of paint or other organic finishes.*

Free Service Report Gives You Details!

A 3-page Special Service Report gives you further details, describes applications and the many advantages obtained through the use of Oakite CrysCoat No. 86. Write for your FREE copy today.

OAKITE PRODUCTS, INC., 40 Thames St., NEW YORK 6, N. Y.

Technical Service Representatives Located in All Principal Cities of the United States and Canada

OAKITE Buy Bonds for Victory CLEANING

NEW DISCOVERY STEPS UP POLISHERS' PRODUCTION

AVERAGE OF 47% MORE PIECES PER HEAD

MANY USERS REPORT INCREASES OF 100%, 200%, 300% AND MORE!

Amazing *New Kind* of Polishing Wheel Cement Eliminates "Glazing"
Locks in Grains of Emery with New "Vise-Tight" Control

GIVES NEW FLEXIBILITY NEVER BEFORE POSSIBLE!

POLISHING NOW MADE MORE PROFITABLE—After over two years of research, here, at last, is the remarkable *new kind* of polishing wheel cement you have been waiting for. Extensive plant tests reveal that this new production-booster—GRIPMASTER—steps up polishers' production an average of *47% more* pieces per head!

WHY GRIPMASTER IS FAR MORE EFFICIENT—GRIPMASTER contains a secret new high-heat resisting ingredient. It does not "glaze" on the wheel. Its surprising new adhesive action *locks in* the grains of emery with new positive "vise-tight" control. Your stops for wheel changes are cut to a fraction! GRIPMASTER dries quickly at *room temperature:* oven heating is no longer necessary! And, thanks to GRIPMASTER'S greater flexibility, you get more and finer "breaks" when the wheel is "cracked." Result: far better finishes!

ONE GRADE GRIPS ALL GRAINS—Yes, *one grade* of GRIPMASTER grips *all* grains —250 to 20. It is even possible to "oil out" with GRIPMASTER. Nor is a special sizer necessary. With the addition of water only, GRIPMASTER serves as its own sizer! Profit from this amazing new discovery now. Clip and mail the coupon at the right for your *free* one gallon sample of GRIPMASTER *today*.

JOBBER INQUIRIES INVITED

GRIPMASTER

PAT. PEND.

POLISHING WHEEL CEMENT

GRIPMASTER DIVISION, MICHIGAN BLEACH and CHEMICAL COMPANY
1944 EAST WOODBRIDGE (INDUSTRIAL CHEMICALS) DETROIT 7, MICHIGAN

FREE

FOR LIMITED TIME ONLY!
FULL ONE GALLON SAMPLE

MAKE this free test. Discover for yourself how GRIPMASTER Polishing Wheel Cement can step up *your* production. Clip and mail this coupon for *your* free one gallon sample of GRIPMASTER *now!*

GRIPMASTER DIVISION
Michigan Bleach and Chemical Co.
1944 E. Woodbridge Avenue
Detroit 7, Michigan

Gentlemen:

Please send me—*without cost or obligation*—a FREE one gallon sample of GRIPMASTER Polishing Wheel Cement so I can test GRIPMASTER on my own jobs.

NAME.....

TITLE.....

COMPANY.....

ADDRESS.....

CITY.....STATE.....

JUST ATTACH TO YOUR LETTERHEAD

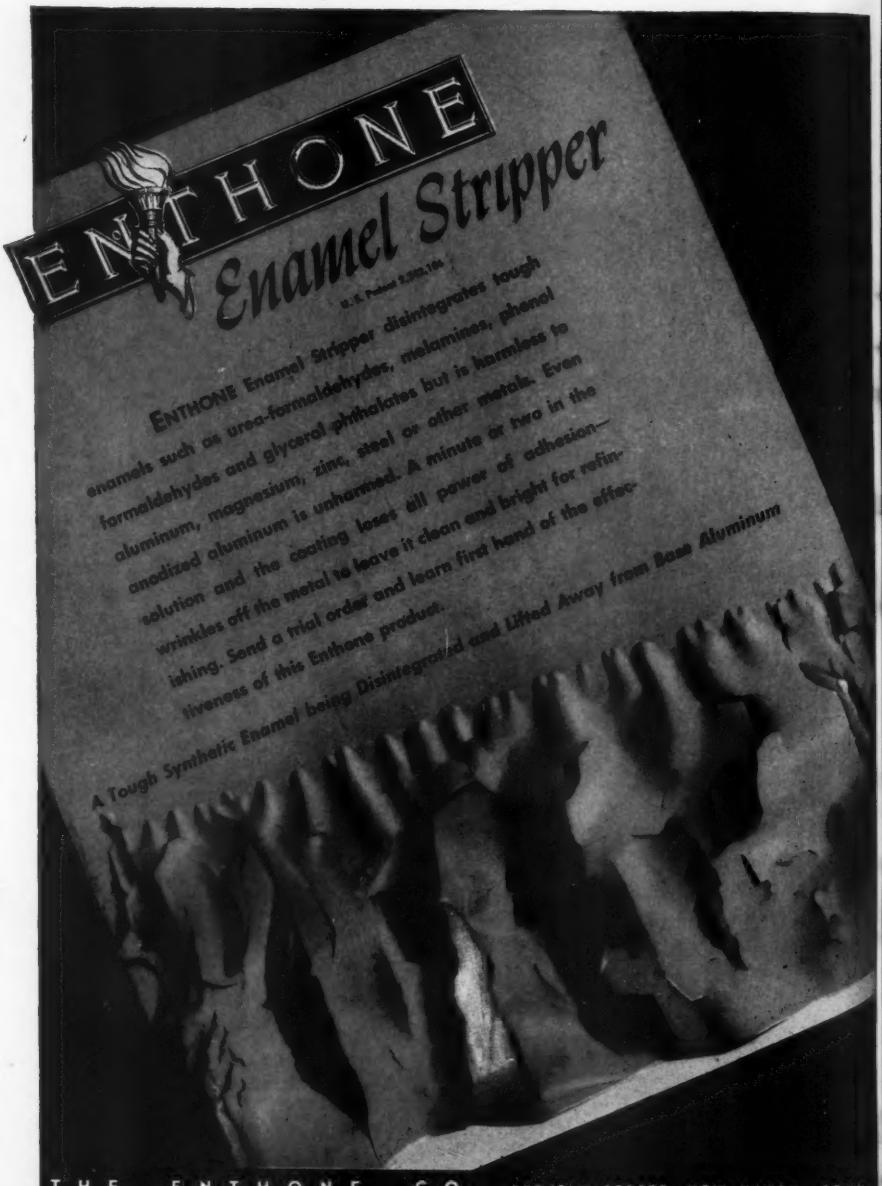
TEAR OUT and MAIL TODAY!

GRIPMASTER

PAT. PEND.

POLISHING WHEEL CEMENT

GRIPMASTER DIVISION, MICHIGAN BLEACH and CHEMICAL COMPANY
1944 EAST WOODBRIDGE (INDUSTRIAL CHEMICALS) DETROIT 7, MICHIGAN


ENTHONE
Enamel Stripper
ENTHONE Enamel Stripper disintegrates tough enamels such as urea-formaldehydes, melamines, phenol formaldehydes and glyceral phthalates but is harmless to aluminum, magnesium, zinc, steel or other metals. Even anodized aluminum is unharmed. A minute or two in the solution and the coating loses all power of adhesion—wrinkles off the metal to leave it clean and bright for refinishing. Send a trial order and learn first hand of the effectiveness of this Enthone product.
A Tough Synthetic Enamel being Disintegrated and Lifted Away from Base Aluminum
THE ENTHONE CO. 447 ELM STREET, NEW HAVEN, CONN.
Chemical Products and Electroplating Equipment